DOCUMENT RESUME

ED 154 635 FL 009 482

AUTHOR	Danoff, Malcolm N.; And Others
TITLE	Evaluation of the Impact of ESEA Title VII Spanish/English Bilingual Education Program. Volume III: Year Two Impact Data, Educational Process, and In-Depth Analyses.
INSTITUTION	American Institutes for Research in the Behavioral Sciences, Palo Alto, Calif.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C. Office of Planning, Budgeting, and Evaluation.
REPORT NO	AIR-48300-1/78-FR-V
PUB DATE	Jan 78
CONTRACT	OEC-0-74-9331
NOTE	458p.; For related document, see FL 009 481
EDRS PRICE	MF-$0.83 HC-$24.77 Plus Postage.
DESCRIPTORS	*Academic Achievement; Biculturalism; *Bilingual Education; *Bilingual Schools; Bilingual Students; Bilingual Teacher Aides; Bilingual Teachers; Classroom Techniques; Educational Objectives; Educational Policy; Elementary Education; Elementary School Students; English (Second Language); Federal Programs; Language Attitudes; Language Instruction; Language Maintenance; Language of Instruction; Language Programs; Language Research; Learning Activities; Learning Processes; Non English Speaking; *Program Evaluation; School Surveys; Second Language Learning; *Spanish Speaking; Student Attitudes; Student Characteristics; Teaching Methods; Test Results
IDENTIFIERS	*Elementary Secondary Education Act Title VII

ABSTRACT

This volume is the further examination of: (1) the impact of the Title VII program, based on student outcome data collected after the publication of Volume One in 1976 and on the continued examination of Volume One data; and (2) educational processes and outcomes found in the Impact Study classrooms. In the first section, a detailed discussion is provided of the analysis of the data: Fall 1976 test score analyses and findings, procedures used, characteristics of the score analysis samples, language use indices, program impact assessment, and other related issues. In the second section, the following topics are discussed: the nature of the student population involved, educational goals, the impact on student achievement and attitudes, the relationship between gains in student achievement and attitudes and instructional process variables, contextual characteristics, and teacher and teacher aide characteristics. The appendices include statistical information and supporting tables. (AMH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED154635

AIR-48300-1/78-FR V

EVALUATION OF THE IMPACT OF ESEA TITLE VII SPANISH/ENGLISH BILINGUAL EDUCATION PROGRAM

Volume III: Year Two Impact Data, Educational Process, and In-Depth Analyses

Malcolm N. Danoff
Gary J. Coles
Donald H. McLaughlin
Dorothy J. Reynolds

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Prepared for
Office of Planning, Budgeting, and Evaluation
Office of Education
Washington, D. C. 20202

AMERICAN INSTITUTES FOR RESEARCH
Palo Alto, California 94302

January 1978

FL009482

The research reported herein was performed pursuant to Contract No. OEC-0-74-9331 with the U.S. Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

CONTENTS

Page

PREFACE xxix

ACKNOWLEDGMENTS xxxi

ABSTRACT xxxvii

I. INTRODUCTION I-1

II. FURTHER EXAMINATION OF THE IMPACT OF TITLE VII II-1

- A. Fall 1976 Test Score Analyses and Findings. II-1
  - Objectives, Constraints, and Design of the Fall 1976 Test Score Analyses. II-1
    - Objectives and constraints. II-1
    - Research design and sampling methodology. . . . II-1
      - The Intensive Sample II-1
      - The Follow-On Sample II-2
  - Sample Selection Issues. II-3
  - Ethnicity of the Students Analyzed II-4
  - Longitudinal Data Requirement. II-5
  - Analysis Variables: Outcomes. II-5
    - English Reading II-5
      - CTBS Expanded Standard Scores. II-6
    - Mathematics II-7
    - CTBS Test Score Transformation. II-7
    - Spanish Reading II-8
    - English as a Second Language (ESL). II-8
  - Analysis Variables: Covariates. II-8
    - Pretest scores. II-8
    - Student Socioeconomic Status Score. II-8
    - The approximate number of school days intervening between the students' fall 1975 testing date and the fall 1976 testing date. II-9

CONTENTS (Continued)

Page

Analysis Variables: Title VII Classroom Enrollment and Community Type. II-10

Analysis Variables: Descriptive Characteristics. II-10

General Analysis Approach. II-10

  Evaluation design II-11

Statistical Procedures Used. II-14

  Analysis of covariance (ANCOVA) II-14

  Standardized gain score analysis. II-15

  Norm-referenced analysis. II-17

Program Impact Hypotheses. II-18

Characteristics of the Fall 1976 Test Score Analysis Samples II-20

  Identification of the Fall 1976 Test Score Analysis Samples II-20

  Characteristics of students in these samples II-21

  Geographic Distribution II-24

  Ethnic groups among Hispanics II-25

  Distribution of bases for presence in Title VII Program. II-26

  Percentage of first year U.S. residences. . . II-26

  Prior exposure to bilingual education II-27

  Average student age II-28

  Average socioeconomic status. II-28

  Average school days absent. II-28

  Teacher assessment of English-speaking ability II-29

  Student assessment of own English-speaking and understanding ability and Spanish-speaking and understanding ability. II-29

  Summary and conclusions II-30

Results: Impact of the Title VII Program on Achievement Gains Measured from Fall 1975 to Fall 1976. . . . . II-32

  Analysis of Covariance. II-32

CONTENTS (Continued)

Page

Standardized residual gain score analysis. II-39

Comparison with national norms. II-41

Summary II-44

B. Further Examination of Fall 1975 to Spring 1976 Data. II-46

Context and Purpose. II-46

Overview of Issues and Analysis Strategies . . . II-47

Language Use Indices II-48

Issues Related to Program Impact Assessment II-59

Attrition and missing data analysis II-59

Time of testing and treatment comparisons . . II-68

Time of testing and norm comparisons. II-71

Differential guessing rates II-74

Ceiling effects II-77

Sensitivity of ESL and CTBS Reading tests to gains. II-82

Out-of-level testing. II-84

Number of boys and girls in each treatment II-87

Program Impact Assessment. II-88

Analytic approach and methods II-88

Outcome variables analyzed. II-89

Standardized residual gain score analysis . . II-89

Analysis of covariance. II-96

Comparisons with norms. II-97

Summary of the in-depth analyses of Title VII impact on Hispanic students II-103

Other Issues II-107

Reliability and validity of teacher judgments II-107

Prior bilingual education experience. II-110

Packet assignment validity. II-117

Reason for student being in Title VI classroom II-118

CONTENTS (Continued)

Page

Educational goals of Title VII projects in the Study. II-127

III. EDUCATIONAL PROCESSES AND OUTCOMES III-1

A. Objectives, Sampling Methodology, and Procedures . . . III-1

B. Analysis Approach. III-3

C. Processes, Characteristics, and Outcomes Analyzed. . . III-6

Educational Processes III-6

Contextual Characteristics. III-10

Teacher and Teacher/Aide Characteristics. III-11

Educational Outcomes. III-14

D. Results: Correlates of Educational Outcomes III-17

Relationship Between Instructional Processes and Outcomes. III-17

Standardized gain score analysis for English Language Arts educational processes. III-17

Findings by grade III-17

Summary III-18

Standardized gain score analysis for Mathematics educactional processes III-19

Finding by grade. III-19

Summary III-20

Standardized gain score analysis for Spanish Language Arts educational processes. . . III-20

Findings by grade III-21

Summary III-22

Relationship Between Contexual Characteristics and Outcomes. III-22

Findings by grade III-22

Summary III-23

Relationship Between Teacher and Teacher Aide Characteristics and Outcomes III-23

Findings by grade. III-23

CONTENTS (Continued)

Page

Summary. III-26

IV. SUMMARY OF FINDINGS. IV-1

A. Nature of the Student Population Served by Title VII Projects in the Study. IV-1

B. Educational Goals of Title VII Projects in the Study. IV-2

C. Title VII Impact on Student Achievement and Attitudes. IV-3

Fall 1975 to Fall 1976 Analysis IV-3

Further Examination of Fall 1975 to Spring 1976 Data. IV-4

Issues IV-4

Attrition and missing data. IV-4

Time of testing IV-4

Differential guessing rates IV-4

Sensitivity of ESL and CTBS Reading tests IV-5

Mixing of in-level and out-of-level tests IV-5

Number of boys and girls in each treatment IV-5

Title VII impact IV-6

D. Relationship Between Gains in Student Achievement and Attitudes and Instructional Process Variables, Contextual Characteristics, and Teacher and Teacher Aide Characteristics IV-7

Instructional Process Variables IV-7

English language arts educational processes. . . IV-8

Mathematics educational processes. IV-8

Spanish educational processes. IV-8

Contextual Characteristics. IV-9

Teacher and Teacher Aide Characteristics. IV-9

CONTENTS (Continued)

Page

APPENDIXES

Appendix II-A-1

Transformation to Reduce Heterogeneity of Covariance A-3

Appendix II-A-2

Bilingual Impact Study Time of Testing Code A-13

Appendix II-A-3

Supporting Tables for Chapter II, Section A A-17

Appendix II-B

Supporting Tables for Chapter II, Section B A-65

Appendix III-C

Supporting Tables for Chapter III, Section C. A-131

Appendix III-D

Supporting Tables for Chapter III, Section D. A-157

BIBLIOGRAPHY. B-1

TABLES

TABLES IN TEXT Page

Table II-A-1 Sample Selection Stages and Numbers of Students by Ethnic Group--Fall 1975 to Fall 1976 Achievement Analyses, Grades 2 and 3. . . . . II-22

Table II-A-2 Number of Title VII and Non-Title VII Hispanic Students with Complete Data for Each of the Six Outcome Variables of Interest--Fall 1975 to Fall 1976 Achievement Analyses, Grades 2 and 3. . . . . II-23

Table II-A-3 CTBS Reading Total Adjusted Fall 1976 Means and Standard Deviations for Non-Title VII and Title VII Hispanic Students in Grades 2 and 3 . . . . II-33

Table II-A-4 CTBS Reading Total (Rescored) Adjusted Fall 1976 Means and Standard Deviations for Non-Title VII and Title VII Hispanic Students in Grades 2 and 3. . . . . II-34

Table II-A-5 CTBS Reading Vocabulary Adjusted Fall 1976 Means and Standard Deviations for Non-Title VII and Title VII Hispanic Students in Grades 2 and 3. . . . . II-35

Table II-A-6 CTBS Mathematics Computation Adjusted Fall 1976 Means and Standard Deviations for Non-Title VII and Title VII Hispanic Students in Grades 2 and 3. . . . . II-36

Table II-A-7 Percentile Ranks for Average CTBS Expanded Standard Scores and Average Time of Testing for Non-Title VII and Title VII Hispanic Students--Fall 1975 to Fall 1976 Analyses, Cohort 2 . . . . II-42

Table II-A-8 Percentile Ranks for Average CTBS Expanded Standard Scores and Average Time of Testing for Non-Title VII and Title VII Hispanic Students--Fall 1975 to Fall 1976 Analyses, Cohort 3 . . . . II-43

Table II-B-1 Items and Scales Identified in Developing Indices of English and/or Spanish Use II-51

TABLES (Continued)

		Page
Table II-B-2	Loadings for Eleven Items/Scales on Two Unrotated Principal Components, Calibration, and Validation Samples	II-53
Table II-B-3	Calibration Sample and Validation Sample Means and Standard Deviation for Factor Score 1 and Factor Score 2 by Teacher Assessment of Student Lanugage Dominance --All Students.	II-57
Table II-B-4	Relationships Between Treatment Group Membership and Attrition Rates: Number of Hispanic Students Present for Tests in Fall and Spring.	II-61
Table II-B-5	Estimated Corrections to Expanded Standard Score Gains in Different Treatment Groups That Would Result If Attrition Had Been the Same Due to Absences in All Treatments.	II-64
Table II-B-6	Interaction Between Treatment Groups and Omission of Tests for Students Present at Both Pretest and Posttest Sessions: Numbers of Students with Test Scores in Fall and Spring.	II-66
Table II-B-7	Estimated Corrections to Expanded Standard Score Gains in Different Treatment Groups That Would Result If Omission of Tests Had Been the Same in All Treatments	II-67
Table II-B-8	Mean Month of Testing in Fall and Spring for Hispanic Students Who Took Both Fall and Spring Tests.	II-69
Table II-B-9	Correlations of Time of Testing with CTBS Test Scores for Hispanic Students. . . .	II-70
Table II-B-10	Proportions of Guesses versus Omits on CTBS Tests, by Grade and Treatment Group. . .	II-76
Table II-B-11	Ceiling Effects: Skewness and Number of Perfect Scores Obtained, by Hispanic Students in Each Grade, in Title VII With Comparison Classrooms.	II-79

TABLES (Continued)

Page

Table II-B-12 Ceiling Effects: Skewness and Number of Perfect Scores Obtained, by Hispanic Students in Each Grade, in Title VII Without Comparison Classrooms II-80

Table II-B-13 Ceiling Effects: Skewness and Number of Perfect Scores Obtained, by Hispanic Students in Each Grade, in Non-Title VII Classrooms. II-81

Table II-B-14 Fall-to-Spring and Fall-to-Fall Gains on the ESL and CTBS Reading Tests, Expressed in Pretest Standard Deviation Units, for Title VII Hispanic Students Who Took Both Tests II-83

Table II-B-15 Spring Test Scores Obtained by Students Who Took Out-of-Level Tests, Compared to Estimates of Scores They Would Have Achieved on In-Level Tests, by Grade. II-85

Table II-B-16 Estimates of the Amount by Which Out-of-Level Testing May Have Caused Underestimation of the Impact of Title VII II-86

Table II-B-17 Sample Selection Stages and Numbers of Students by Ethnic Group, Fall 1975 to Spring 1976 Achievement Analysis, Grades 2, 3, 4, 5, and 6. . . . . . II-90

Table II-B-18 Fall and Spring Treatment-Test Score Partial Correlations and Standardized Residual Gain Score Analysis for Hispanic Students in Title VII With Comparisons vs. Non-Title VII Classrooms. II-92

Table II-B-19 Fall and Spring Treatment-Test Score Partial Correlations and Standardized Residual Gain Score Analysis for Hispanic Students in Title VII Without Comparisons vs. Non-Title VII Classrooms. II-93

Table II-B-20 Fall and Spring Treatment-Test Score Partial Correlations and Standardized Residual Gain Score Analysis for Hispanic Students in Title VII Pooled versus Non-Title VII Classrooms II-94

TABLES (Continued)

Page

Table II-B-21 Percentile Ranks for Average CTBS Expanded Standard Scores and Average Time of Testing for Non-Title VII and Title VII Hispanic Students--Fall 1975 to Spring 1976 Analyses, Grade 2 . . . . II-98

Table II-B-22 Percentile Ranks for Average CTBS Expanded Standard Scores and Average Time of Testing for Non-Title VII and Title VII Hispanic Students--Fall 1975 to Spring 1976 Analyses, Grade 3 . . . . II-99

Table II-B-23 Percentile Ranks for Average CTBS Expanded Standard Scores and Average Time of Testing for Non-Title VII and Title VII Hispanic Students--Fall 1975 to Spring 1976 Analyses, Grade 4 . . . . II-100

Table II-B-24 Percentile Ranks for Average CTBS Expanded Standard Scores and Average Time of Testing for Non-Title VII and Title VII Hispanic Students--Fall 1975 to Spring 1976 Analyses, Grade 5 . . . . II-101

Table II-B-25 Percentile Ranks for Average CTBS Expanded Standard Scores and Average Time of Testing for Non-Title VII and Title VII Hispanic Students--Fall 1975 to Spring 1976 Analyses, Grade 6 . . . . II-102

Table II-B-26 General Teacher Use of English and Spanish and Instructional Time Devoted to English and Spanish in Title VII Classrooms, by Grade. II-109

Table II-B-27 Measurements of Agreement Between Fall and Spring Teacher Judgments II-111

Table II-B-28 Mean Fall English Reading and Oral Spanish Language Scores for Students Judged to Have Different Linguistic Abilities by Their Teachers II-112

Table II-B-29 Years of Prior Bilingual Education Experience and Their Relations to Fall 1975 Pretest Scores, for Hispanic Title VII Students II-114

Table II-B-30 Mean ESL Scores in Fall 1975 for Hispanic Title VII Participants, by Grade and Number of Years of Prior Bilingual Education II-115

TABLES (Continued)

Page

Table II-B-31 Mean ESL Scores in Spring 1976 for Hispanic Title VII Participants, by Grade and Number of Years of Prior Bilingual Education II-116

Table II-B-32 Percent of Students by Reason for Being in Title VII Classroom. II-122

Table II-B-33 CTBS Reading Total Fall 1975 Expanded Scale Score--Hispanic Title VII Students by Grade and by Reason for Presence in Title VII Classrooms. II-124

Table II-B-34 Preference for English versus Spanish Factor Score--Hispanic Title VII Students by Grade and by Reason for Presence in Title VII Classrooms. II-125

Table II-B-35 Students' Judged Proficiency in English, Fall 1975--Hispanic Title VII Students by Grade and by Reason for Presence in Title VII Classrooms II-126

Table III-A-1 Number of Title VII and Non-Title VII Students, Classrooms, Schools, and Sites Selected for the Intensive Sample by Grade III-2

Table III-C-1 Classroom Level Educational Process Variables III-7

Table III-C-2 Teacher and Teacher Aide Characteristic Variables III-12

Table III-C-3 Student Questionnaire Outcome Variables III-15

TABLES (Continued)

TABLES IN APPENDIXES Page

Table II-A-3-1a Comparison of Title VII and Non-Title Hispanic Foolow-On and Non-Follow-On Students by Geographic Distribution A-19

Table II-A-3-2a Comparison of Title VII Hispanic Follow-On and Non-Foolow-On students by Hispanic Ethnic Group. A-20

Table II-A-3-3a Comparison of Title VII and Non-Title VII Hispanic Follow-On and Non-Follow-On Students by Basis for Presence in Title VII Bilingual Classrooms. A-21

Table II-A-3-4a Comparison of Title VII and Non-Title VII Hispanic Follow-On and Non-Follow-On Students by First Year in a Continental United States School, 1975-76 School Year A-22

Table II-A-3-5a Comparison of Title VII and Non-Title VII Hispanic Follow-On and Non-Follow-On Students by Years in Bilingual Education A-23

Table II-A-3-6a Age of Hispanic Follow-On and Hispanic Non-Follow-On Students, Grades 2 and 3, 1975-76 School Year A-24

Table II-A-3-7a Socioeconomic Status of Hispanic Follow-On and Hispanic Non-Follow-On Students--Grades 2 and 3, 1975-76 School Year A-25

Table II-A-3-8a Number of School Days Absent Between Fall 1975 and Spring 1976 Test Dates--Hispanic Follow-On and Hispanic Non-Follow-On Students, Grades 2 and 3. . . . . . A-26

Table II-A-3-9a Comparison of Title VII and Non-Title VII Hispanic Follow-On and Non-Follow-On Students by Teacher Assessment of Student Language Ability. A-27

Table II-A-3-10a Stuents' Own Assessment of Student Proficiency in Understanding and Speaking English as of Spring 1976--Hispanic Follow-On and Hispanic Non-Follow-On Students. A-28

TABLES (Continued)

Page

Table II-A-3-11a Students' Own Assessment of Student Proficiency in Understanding and Speaking Spanish as of Spring 1976--Hispanic Follow-On and Hispanic Non-Follow-On Students. A-29

Table II-A-3-12a Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students--Fall 1975 to Fall 1976 CTBS Reading Total Score Analysis, Cohort 2. . . . . A-30

Table II-A-3-13a Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students--Fall 1975 to Fall 1976 CTBS Reading Total Score (Rescored) Analysis, Cohort 2. . . . . A-31

Table II-A-3-14a Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students--Fall 1975 to Fall 1976 CTBS Reading Vocabulary Score Analysis, Cohort 2. . . . . A-32

Table II-A-3-15a Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students--Fall 1975 to Fall 1976 CTBS Mathematics Computation Score Analysis, Cohort 2. . . . . A-33

Table II-A-3-16a Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students--Fall 1975 to Fall 1976 Prueba de Lectura (Spanish Reading) Total Score Analysis, Cohort 2. . . . . A-34

Table II-A-3-17a Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students--Fall 1975 to Fall 1976 Prueba de Comprensión Auditiva Inglés (English as a Second Language [ESL] Total Score Analysis, Cohort 2. . . . . A-35

Table II-A-3-18a Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students--Fall 1975 to Fall 1976 CTBS Reading Total Score Analysis, Cohort 3. . . . A-36

Table II-A-3-19a Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students--Fall 1975 to Fall 1976 CTBS Reading Total Score (Rescored) Analysis, Cohort 3. . . . . A-37

TABLES (Continued)

Page

Table II-A-3-20a Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students--Fall 1975 to Fall 1976 CTBS Reading Vocabulary Score Analysis, Cohort 3. . . . . A-38

Table II-A-3-21a Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students--Fall 1975 to Fall 1976 CTBS Mathematics Computation Score Analysis, Cohort 3. . . . . A-39

Table II-A-3-22a Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students--Fall 1975 to Fall 1976 CTBS Prueba de Lectura (Spanish Reading) Total Score Analysis, Cohort 3. . . . . A-40

Table II-A-3-23a Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students--Prueba de Comprensión Auditiva Inglés (English as a Second Language [ESL]) Total Score Analysis, Cohort 3 . . . . A-41

Table II-A-3-24a Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score--Grade 2 Hispanic Students, Fall 1976 Test Score Analysis. A-42

Table II-A-3-25a Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score (Rescored)--Grade 2 Hispanic Students, Fall 1976 Test Score Analysis A-43

Table II-A-3-26a Regression Analysis and Analysis of Covariance Results for CTBS Reading Vocabulary Expanded Standard Score--Grade 2 Hispanic Students, Fall 1976 Test Score Analysis A-44

Table II-A-3-27a Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Computation Expanded Standard Score--Grade 2 Hispanic Students, Fall 1976 Test Score Analysis A-45

TABLES (Continued)

Page

Table II-A-3-28a Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score--Grade 3 Hispanic Students, Fall 1976 Test Score Analysis. A-46

Table II-A-3-29a Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score (Rescored) --Grade 3 Hispanic Students, Fall 1976 Test Score Analysis A-47

Table II-A-3-30a Regression Analysis and Analysis of Covariance Results for CTBS Reading Vocabulary Expanded Standard Score--Grade 3 Hispanic Students, Fall 1976 Test Score Analysis A-48

Table II-A-3-31a Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Computation Expanded Standard Score--Grade 3 Hispanic Students, Fall 1976 Test Score Analysis A-49

Table II-A-3-32a Significance Tests for Covariate Differences (Means) Among Groups--Grade 2 Hispanic Students, Fall 1976 Test Score Analysis A-50

Table II-A-3-33a Significance Tests for Covariate Differences (Means) Among Groups--Grade 3 Hispanic Students, Fall 1976 Test Score Analysis A-51

Table II-A-3-34a Correlations and Partial Correlations Between Title VII (With Comparison)/ Non-Title VII Group Membership and Fall 1975, Spring 1976, and Fall 1976 Test Scores--Grade 2, Hispanic Students . . . A-52

Table II-A-3-35a Correlations and Partial Correlations Between Title VII (With Comparison)/ Non-Title VII Group Membership and Fall 1975, Spring 1976, and Fall 1976 Test Scores--Grade 3, Hispanic Students . . . A-54

TABLES (Continued)

Page

Table-II-A-3-36a Correlations and Partial Correlations Between Title VII (With Comparison)/ Title VII (Without Comparison) Group Membership and Fall 1975, Spring 1976, and Fall 1976 Test Scores--Grade 2, Hispanic Students A-56

Table II-A-3-37a Correlations and Partial Correlations Between Title VII (With Comparison)/ Title VII (Without Comparison) Group Membership and Fall 1975, Spring 1976, and Fall 1976 Test Scores--Grade 3, Hispanic Students A-58

Table II-A-3-38a Correlations and Partial Correlations Between Title VII (Pooled)/Non-Title VII Group Membership and Fall 1975, Spring 1976, and Fall 1976 Test Scores--Grade 2, Hispanic Students. A-60

Table II-A-3-39a Correlations and Partial Correlations Between Title VII (Pooled)/Non-Title VII Group Membership and Fall 1975, Spring 1976, and Fall 1976 Test Scores--Grade 3, Hispanic Students. A-62

Table II-B-1a Calibration Sample and Validation Sample Means and Standard Deviation for Factor Score 1 and Factor Score 2 by Teacher Assessment of Student Language Dominance--Grade 2 Students. A-67

Table II-B-2a Calibration Sample and Validation Sample Means and Standard Deviation for Factor Score 1 and Factor Score 2 by Teacher Assessment of Student Language Dominance--Grade 3 Students. A-68

Table II-B-3a Calibration Sample and Validation Sample Means and Standard Deviation for Factor Score 1 and Factor Score 2 by Teacher Assessment of Student Language Dominance--Grade 4 Students. A-69

Table II-B-4a Calibration Sample and Validation Sample Means and Standard Deviation for Factor Score 1 and Factor Score 2 by Teacher Assessment of Student Language Dominance--Grade 5 Students. A-70

TABLES (Continued)

		Page
Table II-B-5a	Calibration Sample and Validation Sample Means and Standard Deviation for Factor Score 1 and Factor Score 2 By Teacher Assessment of Student Language Dominance--Grade 6 Students.	A-71
Table II-B-6a	Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis	A-72
Table II-B-7a	Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis	A-73
Table II-B-8a	Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis	A-74
Table II-B-9a	Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Exapanded Standard Score--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis	A-75
Table II-B-10a	Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score--Grade 6 Hispanic Students, Spring 1976 Test Score Analysis	A-76
Table II-B-11a	Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score (Rescored)--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis	A-77
Table II-B-12a	Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score (Rescored)--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis	A-78
Table II-B-13a	Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score (Rescored)--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis	A-79

TABLES (Continued)

Page

Table II-B-14a Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score (Rescored) --Grade 5 Hispanic Students, Spring 1976 Test Score Analysis. A-80

Table II-B-15a Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score (Rescored) --Grade 6 Hispanic Students, Spring 1976 Test Score Analysis A-81

Table II-B-16a Regression Analysis and Analysis of Covariance Results for CTBS Reading Vocabulary Expanded Standard Score --Grade 2 Hispanic Students, Spring 1976 Test Score Analysis A-82

Table II-B-17a Regression Analysis and Analysis of Covariance Results for CTBS Reading Vocabulary Expanded Standard Score --Grade 3 Hispanic Students, Spring 1976 Test Score Analysis A-83

Table II-B-18a Regression Analysis and Analysis of Covariance Results for CTBS Reading Vocabulary Expanded Standard Score --Grade 4 Hispanic Students, Spring 1976 Test Score Analysis A-84

Table II-B-19a Regression Analysis and Analysis of Covariance Results for CTBS Reading Vocabulary Expanded Standard Score --Grade 5 Hispanic Students, Spring 1976 Test Score Analysis A-85

Table II-B-20a Regression Analysis and Analysis of Covariance Results for CTBS Reading Vocabulary Expanded Standard Score --Grade 6 Hispanic Students, Spring 1976 Test Score Analysis A-86

Table II-B-21a Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Computation Expanded Standard Score --Grade 2 Hispanic Students, Spring 1976 Test Score Analysis A-87

Table II-B-22a Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Computation Expanded Standard Score --Grade 3 Hispanic Students, Spring 1976 Test Score Analysis A-88

TABLES (Continued)

Page

Table II-B-23a Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Computation Expanded Standard Score --Grade 4 Hispanic Students, Spring 1976 Test Score Analysis. A-89

Table II-B-24a Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Computation Expanded Standard Score --Grade 5 Hispanic Students, Spring 1976 Test Score Analysis. A-90

Table II-B-25a Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Computation Expanded Standard Score --Grade 6 Hispanic Students, Spring 1976 Test Score Analysis. A-91

Table II-B-26a Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Total Expanded Standard Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis. A-92

Table II-B-27a Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Total Expanded Standard Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis. A-93

Table II-B-28a Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Total Expanded Standard Score--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis. A-94

Table II-B-29a Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Total Expanded Standard Score--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis. A-95

Table II-B-30a Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Total Expanded Standard Score--Grade 6 Hispanic Students, Spring 1976 Test Score Analysis. A-96

TABLES (Continued)

		Page
Table II-B-31a	Regression Analysis and Analysis of Covariance Results for English as a Second Language Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis.	A-97
Table II-B-32a	Regression Analysis and Analysis of Covariance Results for English as a Second Language Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis.	A-98
Table II-B-33a	Regression Analysis and Analysis of Covariance Results for English as a Second Language Score--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis.	A-99
Table II-B-34a	Regression Analysis and Analysis of Covariance Results for English as a Second Language Score--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis.	A-100
Table II-B-35a	Regression Analysis and Analysis of Covariance Results for Prueba de Lectura Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis.	A-101
Table II-B-36a	Regression Analysis and Analysis of Covariance Results for Prueba de Lectura Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis.	A-102
Table II-B-37a	Regression Analysis and Analysis of Covariance Results for Prueba de Lectura Score--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis.	A-103
Table II-B-38a	Regression Analysis and Analysis of Covariance Results for Prueba de Lectura Score--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis.	A-104

TABLES (Continued)

Page

Table II-B-39a Regression Analysis and Analysis of Covariance Results for Spanish as a Second Language Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis. A-105

Table II-B-40a Regression Analysis and Analysis of Covariance Results for Spanish as a Second Language Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis. A-106

Table II-B-41a Regression Analysis and Analysis of Covariance Results for Spanish as a Second Language Score--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis. A-107

Table II-B-42a Regression Analysis and Analysis of Covariance Results for Spanish as a Second Language Score--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis. A-108

Table II-B-43a Regression Analysis and Analysis of Covariance Results for Spanish as a Second Language Score--Grade 6 Hispanic Students, Spring 1976 Test Score Analysis. A-109

Table II-B-44a Regression Analysis and Analysis of Covariance Results for Attitude Toward School Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis A-110

Table II-B-45a Regression Analysis and Analysis of Covariance Results for Attitude Toward School Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis A-111

Table II-B-46a Regression Analysis and Analysis of Covariance Results Attitude Toward School Score--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis A-112

Table II-B-47a Regression Analysis and Analysis of Covariance Results for Attitude Toward School Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis A-113

TABLES (Continued)

Page

Table II-B-48a Regression Analysis and Analysis of Covariance Results for Attitude Toward School Score--Grade 6 Hispanic Students, Spring 1976 Test Score Analysis A-114

Table II-B-49a Regression Analysis and Analysis of Covariance Results for Attitude Toward English Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis A-115

Table II-B-50a Regression Analysis and Analysis of Covariance Results for Attitude Toward English Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis A-116

Table II-B-51a Regression Analysis and Analysis of Covariance Results for Attitude Toward English Score--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis A-117

Table II-B-52a Regression Analysis and Analysis of Covariance Results for Attitude Toward English Score--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis A-118

Table II-B-53a Regression Analysis and Analysis of Covariance Results for Attitude Toward English Score--Grade 6 Hispanic Students, Spring 1976 Test Score Analysis A-119

Table II-B-54a Regression Analysis and Analysis of Covariance Results for Attitude Toward Spanish Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis A-120

Table II-B-55a Regression Analysis and Analysis of Covariance Results for Attitude Toward Spanish Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis A-121

Table II-B-56a Regression Analysis and Analysis of Covariance Results for Attitude Toward Spanish Score-rade 4 Hispanic Students, Spring 1976 Test Score Analysis A-122

Table II-B-57a Regression Analysis and Analysis of Covariance Results for Attitude Toward Spanish Score--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis A-123

TABLES (Continued)

		Page
Table II-B-58a	Regression Analysis and Analysis of Covariance Results for Attitude Toward Spanish Score--Grade 6 Hispanic Students, Spring 1976 Test Score Analysis	A-124
Table II-B-59a	Contribution of Pretest Scores and Years of Prior Bilingual Education Experience to Prediction of Posttest Scores, for Hispanic Title VII Students-Grade 2	A-125
Table II-B-60a	Contribution of Pretest Scores and Years of Prior Bilingual Education Experience to Prediction of Posttest Scores, for Hispanic Title VII Students--Grade 3.	A-126
Table II-B-61a	Contribution of Pretest Scores and Years of Prior Bilingual Education Experience to Prediction of Posttest Scores, for Hispanic Title VII Students--Grade 4.	A-127
Table II-B-62a	Contribution of Pretest Scores and Years of Prior Bilingual Education Experience to Prediction of Posttest Scores for Hispanic Title VII Students--Grade 5.	A-128
Table II-B-63a	Contribution of Pretest Scores and Years of Prior Bilingual Education Experience to Prediction of Posttest Scores, for Hispanic Title VII Students-Grade 6	A-129
Table III-C-1a	Classroom Level Educational Procees Variables--Range of Values, Description, and Response Alternatives	A-133
Table III-C-2a	Contextual Characteristics Variables--Response Alternatives and Coded Values. . . .	A-141
Table III-C-3a	Teacher and Teacher Aide Characteristic Variables--Response Alternatives and Coded Values	A-143
Table III-C-4a	Student Questionnaire Outcome Variables--Response Alternatives and Coded Values. . . .	A-150
Table III-D-1a	Standardized Gain Score Analysis for English Language Arts Educational Processes--Grade 2.	A-159

TABLES (Continued)

Page

Table III-D-2a Standardized Gain Score Analysis for English Language Arts Educational Processes--Grade 3. . . . . A-160

Table III-D-3a Standardized Gain Score Analysis for English Language Arts Educational Processes--Grade 4. . . . . A-161

Table III-D-4a Standardized Gain Score Analysis for English Language Arts Educational Processes--Grade 5. . . . . A-162

Table III-D-5a Standardized Gain Score Analysis for English Language Arts Educational Processes--Grade 6. . . . . A-163

Table III-D-6a Standardized Gain Score Analysis for Educational Processes in Mathematics --Grade 2 . . . . A-164

Table III-D-7a Standardized Gain Score Analysis for Educational Processes in Mathematics --Grade 3 . . . . A-165

Table III-D-8a Standardized Gain Score Analysis for Educational Processes in Mathematics --Grade 4 . . . . A-166

Table III-D-9a Standardized Gain Score Analysis for Educational Processes in Mathematics --Grade 5 . . . . A-167

Table III-D-10a Standardized Gain Score Analysis for Educational Processes in Mathematics --Grade 6 . . . . A-168

Table III-D-11a Standardized Gain Score Analysis for Educational Processes in Spanish Language Arts--Grade 2 . . . . A-169

Table III-D-12a Standardized Gain Score Analysis for Educational Processes in Spanish Language Arts--Grade 3 . . . . A-170

Table III-D-13a Standardized Gain Score Analysis for Educational Processes in Spanish Language Arts--Grade 4 . . . . A-171

Table III-D-14a Standardized Gain Score Analysis for Educational Processes in Spanish Language Arts--Grade 5 . . . . A-172

TABLES (Continued)

Page

Table III-D-15a Standardized Gain Score Analysis for Educational Processes in Spanish Language Arts--Grade 6. . . . . A-173

Table III-D-16a Standardized Gain Score Analysis for Contextual Characteristics--Grade 2 . . . . . A-174

Table III-D-17a Standardized Gain Score Analysis for Contextual Characteristics--Grade 3 . . . . . A-175

Table III-D-18a Standardized Gain Score Analysis for Contextual Characteristics--Grade 4 . . . . . A-176

Table III-D-19a Standardized Gain Score Analysis for Contextual Characteristics--Grade 5 . . . . . A-177

Table III-D-20a Standardized Gain Score Analysis for Contextual Characteristics--Grade 6 . . . . . A-178

Table III-D-21a Standardized Gain Score Analysis for Teacher/Teacher Aide Characteristics --Grade 2 . . . . A-179

Table III-D-22a Standardized Gain Score Analysis for Teacher/Teacher Aide Characteristics --Grade 3 . . . . A-180

Table III-D-23a Standardized Gain Score Analysis for Teacher/Teacher Aide Characteristics --Grade 4 . . . . A-181

Table III-D-24a Standardized Gain Score Analysis for Teacher/Teacher Aide Characteristics --Grade 5 . . . . A-182

Table III-D-25a Standardized Gain Score Analysis for Teacher/Teacher Aide Characteristics --Grade 6 . . . . A-183

FIGURES

FIGURES IN TEXT

Page

Figure 1. Distribution of Total Reading scores by time of testing for all Hispanic students in the Study who were present for fall and spring testing . . . .

Figure 2. Distribution of Total Mathematics scores by time of testing for all Hispanic students in the Study who were present for fall and spring testing. . . . .

Figure 3. Mean Linguistic Factor Scores of Title VII students who received each of the four packets in each grade. . . . .

Figure 4 Mean Linguistic Factor Scores of Non-Title VII students who received each of the four test packets in each grade. . . . . .

Figure 5. Mean Linguistic Factor Scores of all students in the Study who received each of the four test packets in each grade. . . . . .

FIGURES IN APPENDIXES

Figure 1-A. Bivariate distribution of untransformed scores, based on second-grade cohort fall 1975 and fall 1976 Total Reading expanded scale scores for Non-Title VII classrooms. A-6

Fibure 2-A. Equiprobability contours that are rendered parallel by applying $T(x) = \log(M-x)$ to pretest and posttest scores A-8

Figure 3-A. Equiprobability contours that are rendered parallel by applying $T(x) = \log(m^2-x^2)$ to pretest and posttest scores A-9

Figure 4-A. Bivariate distribution of transformed scores, based on second-grade cohort fall 1975 and fall 1976 Total Reading expanded scale scores for Non-Title VII classrooms. A-11

PREFACE

This report is the third volume dealing with the Evaluation of the Impact of the ESEA Title VII Spanish/English Bilingual Program conducted by the American Institutes for Research for the U.S. Office of Education. It will address the impact of the Title VII Program based on student outcome data collected after the publication of Volume I and on the continued examination of Volume I data. This volume will also examine educational processes and outcomes found in the Impact Study classrooms.

Volume I presented the Study's design and findings based on the fall 1975 to spring 1976 data. Volume II contained detailed site descriptions of the participating projects and districts.

The Impact Study was one of three studies concerned with the evaluation of bilingual education projects and was funded by the U.S. Office of Education under a contract with the American Institutes for Research. The following reports have been prepared under this contract:

> The Identification and Description of Exemplary Bilingual Education Programs (AIR Report 48300-8/75-FR I), August 1975 (ERIC Report #ED 123-893)
>
> Study of Bilingual-Bicultural Projects Involving Native American, Indo-European, Asian and Pacific Language Groups (AIR Report 48300-8/75-FR II), September 1975 (ERIC Report #ED 123-894)
>
> Evaluation of the Impact of ESEA Title VII Spanish/English Bilingual Education Program, Volume I: Study Design and Interim Findings (AIR Report 48300-2/77-FR III)
>
> Evaluation of the Impact of ESEA Title VII Spanish/English Bilingual Education Program, Volume II: Project Descriptions (AIR Report 48300-2/77-FR IV)

Copies of these reports are available from the U.S. Office of Education, Office of Planning, Budgeting, and Evaluation, 400 Maryland Avenue S.W., Federal Office Building #6, Washington, D.C. 20202, and also from the ERIC Document Reproduction Service, P.O. Box 190, Arlington, Virginia 22210. Volume III of the Impact Study is available from the U.S. Office of Education at the above address and will also be available through the ERIC system.

Copies of the various questionnaires and other non-copyrighted data collection instruments used in the Impact Study are on file with the ERIC system. Publishers of the cognitive tests used in the study should be contacted directly.

ACKNOWLEDGMENTS

We wish to thank the school districts and the ESEA Title VII projects for their cooperation during the conduct of this Study. All of those listed below particpated during the 1975-76 school year; most were also involved in the Follow-On Sample during the 1976-77 school year. Without their help, the field data collection efforts could not have been accomplished.

Douglas Bilingual-Bicultural Program
Douglas Public Schools, Arizona

Bay Area Bilingual Education League (BABEL)
Berkeley Unified School District, California

Bay Area Bilingual Education League (BABEL)
Jefferson Elementary School District, California

Bay Area Bilingual Education League (BABEL)
Oakland Unified School District, California

Bay Area Bilingual Education League (BABEL)
Richmond Unified School District, California

Bilingual-Multicultural Education Program
Hayward Unified School District, California

Bilingual Multicultural Education Project
Pajaro Valley Unified School District, California

Comprehensive Bilingual Education Program
New Haven Unified School District, California

Upper Valley Intercultural Program
Dixon and West Placer Unified School Districts, California

Bilingual Foundation for School Success
Bridgeport Board of Education, Connecticut

Project EXITO
Hartford Board of Education, Connecticut

Jackson-McLaren Elementary Bilingual-Bicultural Center
Kosciusko Bilingual Program
Chicago Board of Education, Illinois

New Orleans Bilingual Bicultural Education Program
New Orleans Public Schools, Louisiana

Bilingual-Bicultural Education Program
Chelsea Public Schools, Massachusetts

Bilingual-Bicultural Program for Spanish/English Speaking Students
Grand Rapids Public Schools, Michigan

Detroit's Comprehensive Bilingual-Bicultural Education Program
School District of Detroit, Michigan

Project Better Communication
New Brunswick Board of Education, New Jersey

Taos Bilingual-Bicultural Program
Taos Municipal Schools, New Mexico

Bilingual-Bicultural Program
Consolidated School District #24, New York

Bilingual Education Department
Beacon Enlarged School District, New York

Bilingual Education Program
Buffalo Public Schools, New York

Bilingual Focus for the Seventies
Consolidated School District #6, New York

Bilingual Mini-School 59
Consolidated School District #10, New York

Bilingual School Complex
Consolidated School District #8, New York

District Three Bilingual Program
Consolidated School District #3, New York

North Rockland Bilingual Program, Project Advance
North Rockland Central School District, New York

Title VII Bilingual Program - Bilingual Community School
Consolidated School District #12, New York

Amistad Bilingual Education Program
Southside Independent School District, Texas

Bilingual-Bicultural Education Program
Crystal City Independent School District, Texas

Bilingual Education Program: To Be Bilingual Is To Be Bicultural
Brownsville Consolidated Independent School District, Texas

Bilingual-Multicultural Education Program
Dallas Independent School District, Texas

Bishop Bilingual Program
Bishop Consolidated School District, Texas

Developing Bilingual Citizens
Rio Grande Consolidated Independent School District, Texas

Eagle Pass Elementary Bilingual Education Program
Eagle Pass Independent School District, Texas

Podemos Ser Juntos Amigos
Pharr-San Juan-Alamo Independent School District, Texas

Project ABLE
Abilene Independent School District, Texas

Robstown Bilingual Education Program
Robstown Independent School District, Texas

The contributions of the Study's Bilingual Advisory Panel, Test Advisory Panel, and Design and Analysis Panel were acknowledged in Volume I. While these panels were most active during the planning and design of the Study and their contributions were acknowledged in Volume I, we wish to thank them again for their contributions to the Study. The following is a list of these panels and members:

Bilingual Advisory Panel

Dr. Alfredo Castañeda, Professor of Education
Stanford University
Stanford, California

Dr. Jack Forbes, Professor, Native American Studies
University of California
Berkeley, California

Dr. Severo Gomez, Assistant Commissioner of Education
Office of International and Bilingual Education
Austin, Texas

Ms. Agnes Holm, Navajo Language Specialist
Chinle, Arizona

Mr. Lemuel Ignacio, Chairman of Pacific Asian Coalition
San Francisco, California

Mr. Wayne Newell, Representative of International
  Native American Bilingual Education Conference and
  Director of Wabnaki Bilingual Education Program
Princeton, Maine

Mr. Daniel Peaches, Representative of the National Advisory Council on Indian Education
Window Rock, Arizona

Dr. Helen Redbird-Selam, Professor
Oregon College of Education
Monmouth, Oregon

Mr. Polo Rivera, Representative of League of United Latin American Citizens
Phoenix, Arizona

Mr. Thomas Roybal, Representative of National Advisory Council on Bilingual Education
San Luis Obispo, California

Dr. Eleanor Sandstrom, Director of Foreign Languages
School District of Philadelphia
Philadelphia, Pennsylvania

Mr. Ling-Chi Wang, Professor, Asian Studies
University of California
Berkeley, California

Test Advisory Panel and Design and Analysis Panel

Dr. Robert L. Ebel, Professor
Michigan State University

Dr. J. Thomas Hastings, Professor
University of Illinois

Dr. Robert Linn, Professor
University of Illinois

Dr. Rosedith Sitgreaves, Professor
Stanford University

Dr. Maurice M. Tatsuoka, Professor
University of Illinois

We also wish to thank again Dr. Ricardo Cornejo for his assistance in examining the Prueba de Lectura for lexical bias.

While we acknowledge the important contributions that have been made by the advisory panels and consultants to this project, the views expressed in this report remain the responsibility of the authors.

Many individuals have been involved as AIR project staff with the Study since its inception in 1974. We would like to acknowledge the contributions made by Antonio de Porcel, Beatríz Arias, Griselda Castro, Mary Teresa Delgado, Tracy Grey, Osvaldo Grijalva, Ruddi Irizarry, Nancy Locks, Barbara Pletcher, Dorothy Reynolds, and Bonnie Sisson during the selection/development of the student, teacher, parent, and advisory committee questionnaires, the student tests, the educational treatment documentation instruments, and the data collection strategy. Their efforts during the data collection phases, which included training local data coordinators, coordinating test administration, and collecting project documentation, are also appreciated.

The extensive amounts of data collected by the Study involved complicated data management activities. We would like to thank Naomi Bloom and Bruce Everett for their contributions. The analyses of these data for Volume III required many hours of extra effort on the part of Gary Coles, the Study's Manager for Analysis, and David Gross, who carried out the computer runs. The Study is greatly indebted to them. We also wish to thank Donald McLaughlin for his assistance with the analysis of the data and for his preparation of major sections of this volume. Dorothy Reynolds was a very valuable member of the project team from its inception, and we are indebted to her, especially for her contributions to Volume III. On many occasions, Marion Shaycoft provided guidance as the AIR internal statistical consultant to the Study, and we wish to thank her for her contributions.

Arranging for the myriad of details involved in the logistical operations required in sending out and receiving the many thousands of instruments could not have been accomplished without the efforts of Martha Gregory and her staff, Pamela Carr, Spring Garret, Angelica Hampel, Joan Hansen, Diane Hill, Leonard Lutomski, and Standish Sibley.

The various reports related to the Study's findings were prepared with the assistance of Caroline Dillman, who served as style editor and publications coordinator. She was assisted by Donald Reed and Leonard Lutomski. We appreciate their careful work and attention to the many details involved. The patience and competence of the project administrative assistant, Peggy Young, played a significant role in all aspects of the Study, especially during report preparation.

Finally, we wish to thank all those in the Office of Education who contributed their support and assistance during the conduct of the Study. We are indebted to Mr. Edward Glassman, the Office of Education's technical monitor for the project during the planning year and most of the 1975-76 school year data collection, for his valuable guidance and assistance. We are also indebted to Dr. David Shoemaker, the project's current technical monitor, for his guidance and help during the planning and preparation of Volumes I, II, and III and for his assistance in making the arrangements for the 1976-77 school year data collection.

Malcolm N. Danoff

ABSTRACT

Background and Rationale

In 1974, to assess the status of federally funded (ESEA Title VII) bilingual education projects in the United States, the U.S. Office of Education/Office of Planning, Budgeting, and Evaluation contracted with the American Institutes for Research (AIR) to conduct an "Impact" study of such projects. During the first two years of the project, the Study was designed and the first year's data collection in the schools was carried out. At the end of this first year's data collection, two volumes were produced by AIR project staff. Volume I presented the Study's design and findings based on the fall 1975 to spring 1976 data, the data collected during the first year's data collection efforts. Volume II contained detailed site descriptions of the participating ESEA Title VII projects and the districts in which they were located. These volumes were issued not only to provide interim results, but also to elicit comments and reviews to provide inputs for future analyses and reports.

This volume (Volume III) will address the impact of the Title VII Program based on student outcome data collected during the second year of field data collection and on the continued examination of Volume I data. This volume will also examine educational processes, teacher and teacher aide characteristics, and contextual variables as they relate to outcomes measured in the Impact Study classrooms.

Fall 1976 Test Score Analyses and Findings

Data collected during the fall of 1976 were used as additional outcome measures by which the impact of Title VII could be evaluated using fall 1975 to fall 1976 analyses. The sample of students tested at this third data point included only those who had been in the second or third grades during the previous school year and who were in classrooms selected for the Intensive Sample during the previous year. Testing was conducted using the same local data collection system established for the first year's data collection. The analysis variables used for the

analyses of the fall 1976 test score data were largely those used and discussed in Volume I, since the objective of the fall 1975 to fall 1976 analysis was to corroborate the evaluation of Program impact during the 1975-76 school year in a small number of classrooms but over a longer interval of time.

Program impact was analyzed by means of three different comparative analytic approaches: (1) regression analysis and analysis of covariance (ANCOVA), (2) standardized gain score analysis and partial correlation analysis, and (3) comparison with Comprehensive Test of Basic Skills (CTBS) national norms. Each analysis was preceded by a number of preliminary analyses that permitted the evaluation of whether or not the techniques' statistical assumptions were tenable.

Comparison Between Follow-On and Non-Follow-On Sample Characteristics

Because it was important to determine to what extent the students who were followed for testing in the fall 1976 were similar to those students who were not followed, a number of comparisons were made. The results of these comparisons were as follows:

- Geographic distribution: Follow-On Sample was less balanced across the geographic regions.
- Ethnic group among Hispanic: Follow-On and Non-Follow-On Samples were not very similar with respect to percentages of students in each of the two major Hispanic subgroups in the Study, Mexican-American and Puerto Rican.
- Basis for presence in Title VII classrooms: Fewer of the students in the Follow-On Sample than in the Non-Follow-On Sample were judged by their teachers in the 1975-76 school year to have been in the Title VII classroom because of their need for English instruction.

- Percentage of students for whom the 1975-76 school year was their first year in the United States: Follow-On and Non-Follow-On Samples were quite similar with respect to this characteristic.
- Prior exposure to bilingual education: Follow-On and Non-Follow-On Samples appear similar with respect to this characteristic.
- Average student age by grade: No significant differences between Follow-On and Non-Follow-On Samples.
- Average socioeconomic status: Differences were found between the Follow-On and Non-Follow-On Title VII Samples in the second grade, with the Follow-On Sample having a significantly higher socioeconomic status than the Non-Follow-On Sample.
- Average school days absent: The Follow-On and Non-Follow-On Samples were essentially similar with respect to this characteristic with any differences being limited to 3 or 4 days for the school year.
- Teacher assessment of English- and Spanish-speaking ability: The Follow-On Title VII third grade had more Spanish monolingual students than did the Non-Follow-On Title VII Sample.
- Student assessment of English- and Spanish-speaking ability: The Follow-On and Non-Follow-On Samples were generally similar with respect to this characteristic. No significant differences were found.

Thus it appears that the Follow-On and Non-Follow-On Samples differed in several important aspects, and it appeared reasonable to consider the data collected in the fall of 1976 as data from a somewhat different subset of Title VII and Non-Title VII students from those involved in the 1975-76 school year analysis.

Results

The analysis of covariance procedures computed the proportions of variance accounted for in the fall 1976 scores in English Reading (Reading Total and Reading Total Rescored) and Vocabulary and in Mathematics by Title VII and Non-Title VII treatment and by the three covariates: pretest, socioeconomic status, and number of days at school between pretest and posttest. The means and standard deviations of the key posttest variables were then adjusted to remove the effects of the three covariates. These procedures did not adequately correct for the possible undercorrection artifact. In order to investigate further the undercorrection artifact, the standardized residual gain score analyses were performed.

The most common method for avoiding the undercorrection artifact is to perform analysis of variance on the gain scores. None of the results of allowable tests using the standardized residual gain score analysis indicated significant positive effects because of the Title VII treatment in comparison with Non-Title VII treatments between fall 1975 and fall 1976.

The overall results from the fall 1975 to fall 1976 (Follow-On Sample) can be summarized succinctly. For both the grade 2 cohort and the grade 3 cohort, the fall-to-fall achievement gains resulting from the Title VII Program were neither significantly nor substantially different from what would have been expected without Title VII treatment, with one possible exception: the grade 3 cohort of Title VII children in communities for which no comparison classrooms were available (i.e., in the urban Northeast region) showed dramatic gains in Mathematics Computation skills.

The conclusions reached here are similar to those reached in Volume I, based on fall-to-spring gains, for Hispanic students. The most important differences appear to be due more to restriction of the sample and possibly to revisions in the analytical methods than to reversals of effects over the summer. The figures for the spring scores show little difference from corresponding fall 1976 figures.

Further Examination of Fall 1975 to Spring 1976 Data

Issues that might affect the interpretation of Program impact comparisons were examined: (1) attrition due to absence or to the omission of particular tests for different children, (2) differential time of testing, (3) the effects of differential guessing rates on the impact analyses, (4) test ceiling effects, (5) the use of other measures of English competence in addition to the CTBS Reading tests to assess impact, (6) possible effects of mixing in-level and out-of-level tests in impact analyses, and (7) the possibility that differential numbers of boys and girls in different treatments might distort impact analyses.

In addition, Volume I findings related to reasons for students being in Title VII classrooms and to educational goals of Title VII projects were examined in more detail. Reliability and validity of teacher judgments were also further examined.

Attrition Analysis

This analysis showed that although there were some significant differences across treatment groups in attrition and test omission effects, their effects on the Program impact analyses are generally not substantial. In the few cases where they might be substantial, employing the estimated corrections would only have the effect of making Title VII gains appear smaller. Thus, differential attrition and test omissions could not have been the cause of any lack of finding significant benefits from Title VII treatments in terms of gains on CTBS scales.

Time of Testing Analysis

Any group tested earlier in the fall and later in the spring than other groups could likely have a greater opportunity to show gains. Only one difference of more than two weeks (sixth-graders in Title VII With Comparison classrooms had three weeks more time between pretest and posttest than did their peers in Non-Title VII classrooms) was found. All the differences between testing times slightly favored the Title VII students.

Differential Guessing Analysis

If tendency to guess is higher at posttest than at pretest (which is natural because students are likely to be more familiar and at ease with the testing situation in the spring), then artifactual gains will appear; and, if these artifactual gains vary between treatment groups, the results of Program impact analyses will be distorted. Generally, differential guessing effects tend to have been small, and they can generally be ruled out as a source of bias against Title VII in the evaluation.

Out-of-Level Testing Analysis

To test for out-of-level test effects, the mean spring posttest scores obtained by those who took out-of-level tests were compared with estimates of the scores they would have achieved had they taken in-level tests. To obtain the estimates, the regression of posttests on pretests was computed based only on in-level test-takers. This regression equation could be used to predict the average spring posttest score obtained by those who obtained any particular score on the pretest in the fall. In every case, the actual posttest scores obtained on out-of-level tests were lower than the estimates of what the scores would have been had these children taken in-level tests. This was equally true for students in Title VII and Non-Title VII classrooms. Because a larger percentage of students in Title VII classrooms than of those in Non-Title VII classrooms took out-of-level tests, it was therefore necessary to calculate estimates of how much the mean posttest scores would have increased in Title VII classrooms relative to Non-Title VII classrooms if no out-of-level tests had been given. The effects are not large because most children in both groups took in-level tests and because the bias was in the same direction for both groups. Only in grade 3 is there any substantial effect; the average estimate of Title VII's effect on Reading and Vocabulary scores in third grade may underestimate actual gains by 3 to 4 expanded scale score points.

This effect, about 0.1 standard deviation, is not large. Moreover, it is probably an overestimate of the actual distortion in the impact analyses because some of the in-level/out-of-level variance was undoubtedly partialed out in the ANCOVA and standardized residual gain score analyses.

Ceiling Effects Analysis

If a substantial number of students obtained perfect scores on the test forms they were given, this would have complex effects on the interpretation of the impact evaluation analyses. If these students actually scored perfectly on the easy level of a test and should have taken a higher level of the test, the evaluation results could be biased in favor of groups whose teachers were less likely to assign out-of-level tests. In fact, out-of-level tests were given far more frequently by teachers in Title VII classrooms than by teachers in comparison classrooms. There were only a few cases of ceiling effects, and they tended to be on the same tests and in the same grades for Title VII students in classrooms With Comparisons, Title VII students in classrooms Without Comparisons, and Non-Title VII students.

Reliability of Teacher Judgment Analysis

Reliabilities were estimated in terms of fall-spring correlations; then validities were estimated in terms of correlations with other measures. The fall-to-spring correlations represent minimum estimates of reliability because even perfectly reliable estimates could be expected to change as the children being rated change. Teacher estimates of linguistic ability appear to have been reliable and valid, and their estimates of SES components were reliable; their estimates of number of years in bilingual education and of the reasons the students were in the Title VII Program were not quite as reliable.

Sensitivity of ESL and CTBS Reading Tests to Gains

An English oral comprehension test was administered during the Impact Study. However, there do not exist adequate national norms for this ESL test to which Title VII gains can be compared, so the ESL measurement of gains can only be compared between the Title VII and Non-Title VII classrooms in this study, and few students in the latter group took the ESL test.

To determine the relative sensitivity of the ESL test to gains, a comparison was made between gains on the ESL test and gains on the Vocabulary and Reading Total scores on the CTBS test battery. When measured from fall to spring, the ESL test appears to be substantially more sensitive than the CTBS Reading test, especially for second-, third-, and sixth-graders. When measured over a full year, from fall to fall, however, there is no consistent difference in sensitivity. In the period between the spring test and the following fall test, student gains for second- and third-graders were apparently more sensitively measured by the CTBS Reading test.

Prior Bilingual Education Experience

In grades 2, 3, and 4, in no case did the years of prior experience add as much as 1% to the variance accounted for. In grade 5, there was a contribution of 4% to the variance in ESL scores, 2% to the SSL scores, and 1% to the variance only in Prueba de Lectura, ESL, Mathematics Computation, and Attitude Toward Spanish scores.

Number of Boys and Girls in Each Treatment

Analysis of Title VII Program impact in Volume I did not include separate analyses for males and females. Since some reviewers questioned this and also pointed out the relatively large amount of missing data about the sex of the student, it was decided to attempt to determine the sex of the students for whom sex data were not available on their questionnaires and to examine the possible differences between Title VII and Non-Title VII student populations related to this sex variable. Staff familiar with both Hispanic and non-Hispanic first names examined each of the student's names in the Impact Study Sample, and a determination was made whether the name was a boy's or a girl's. By following the procedures just described, sex determination was made for all but about 2% of the students in the Sample.

An examination of the proportions of males and females by grades within Title VII With Comparison, Title VII Without Comparison, Title VII Pooled, and Non-Title VII groups revealed an essentially even distribution of males and females within grades and within Title VII/Non-Title VII classification. It did not, therefore, seem reasonable to assume that sex differences were associated with treatment classification, and thus no further analyses by sex appeared necessary to assess overall Title VII impact.

Test Packet Assignment Validity

Reviewers of Volume I questioned the validity of teacher judgments regarding test packet assignment, so the packet assignments were compared to the two independently derived language preference factors developed for this volume. If the teacher packet assignments were valid, then the students assigned the English monolingual packet should have been high on the English Preference factor and low on the Bilinguality factor; English-dominant bilingual packet students should have been relatively high on both factors; Spanish-dominant bilingual packet students should have been low on the English Preference factor but high on the Bilinguality factor; and the Spanish monolingual packet students should have been relatively low on both factors.

The separation of factor scores between packet-assignment groups in the predicted directions is striking. The relations found reassure us that the teacher judgments were sufficiently valid to support the statements made in Volume I concerning the proportion of Title VII students who were English dominant. Nevertheless, other measures, including the English Preference factor, were examined and corroborate the finding that a majority of Title VII students were English dominant.

Reason for Presence in the Title VII Classroom

As reported in Volume I, generally less than a third of the Hispanic students were considered by their teachers to be enrolled in Title VII classrooms because of their need for English instruction. This finding has both educational and political implications because of the ESEA Title VII legislation's specifications with regard to target students. Title VII legislation was designed to serve the needs of students who have special need for English instruction. Parental request is a basis upon which students may be enrolled in Title VII classrooms. (In fact, it is the primary way by which limited numbers of English-competent students may be enrolled.) Some reviewers suggested that the percent of Hispanic students who were enrolled because of parental request should be added to the percent of students enrolled because of their need for English instruction so that a more accurate picture of the percent of target Hispanic students in the Title VII classrooms could be obtained. It was reasoned that Hispanic students enrolled because of parental request could be as much in need of Title VII services as those enrolled because of their need for English instruction. To look further into this issue, additional analyses of the Hispanic Title VII students stratified by reason for being in Title VII classrooms, were conducted. The results show that across all grades in the Study, the Hispanic students enrolled because of their need for English instruction had significantly lower CTBS Reading scores, significantly lower preference for English rather than Spanish, and significantly lower self-judged proficiency in English than those enrolled because of parental request ($p < .01$).

It thus appears reasonable to consider these two groups of students as being significantly different in their self-assessment of English proficiency, in their preference for English, and in their performance on the English Reading test. The Volume I finding that generally less than a third of Hispanic students enrolled in Title VII classrooms were there because of need for English instruction is not modified by these additional analyses. Students enrolled because of parental request do not show the same need for English instruction as do the students enrolled because of need for English instruction.

Educational Goals of Title VII Projects in the Study

Volume I reported that the data collected from Title VII project directors and staff during the 1975-76 school year site visits by AIR staff indicated that over 85% of the projects retained Spanish-speaking students in their Title VII classrooms even after the students' proficiency in English would enable them to function in a regular classroom. In addition to the findings of the Impact Study, other independent studies have found a very high incidence of "maintenance" projects operating under Title VII Funding (General Accounting Office, May 1976; Epstein, 1977). The project directors participating in the Impact Study were proud of their maintenance goals, which often included the objective that all children, including the English-monolingual and the English-dominant students, become fluent in Spanish as well as in English. Interviews with Title VII teachers and direct observation of Title VII classrooms corroborated this finding. The detailed project goals and procedures for each Impact Study Title VII project were presented in Volume II and further document the project director interview findings.

Some bilingual educators suggest that the term "maintenance program" be reserved for those projects which have bilingual curricula for kindergarten through grade 12. It seems much more appropriate to address the nature of each project and its goals for the grades which it encompasses. The fact that a project may encompass only kindergarten through grade 6 should not prevent an assessment of its goals. The question is related to the project's planned disposition of Hispanic students who learn enough English in the bilingual classroom to function in a regular classroom: Does the project have as a goal (1) the transfer of students into a regular classroom once they can understand the language of instruction in the regular classroom (English) or (2) the retention of students in the bilingual project with the continuation of their Spanish-language instruction and with subject matter courses being taught totally in Spanish or perhaps 50% in English and 50% in Spanish?

The Impact Study, in an effort to avoid the semantic problems inherent in the terms "maintenance" and "transition," assessed this aspect of the projects' goals and intentions by asking for specific project goals and action regarding what happens to students once they are able to function in school in English. Projects that have as a goal the transfer of the student into regular classrooms when he or she is able to do school work in English can clearly be said to have a "transition" approach to bilingual education. In such a project, the student who is moved into the regular classroom makes room in the bilingual classroom for other students who are more needy in terms of their English speaking and understanding ability. Projects that have as a goal the retention of the student in the bilingual classroom even after he or she can function in the regular English-speaking classroom cannot be said to be operating a "transition" program, even though the student may eventually enter a regular English-language classroom when he or she leaves the bilingual project school and goes on to junior high or high school. It should be noted that some projects operate in all classrooms and/or in all schools in an attendance area, so there are no "regular" classrooms available to which English-proficient students might transfer. Such projects obviously reflect a "maintenance" approach to bilingual education, unless their guidelines call for increased instruction in English and decreased instruction in Spanish in the upper grades. However, the Title VII projects in the Intensive Sample spent about equal time per week in English Language Arts instruction and Spanish Language Arts instruction in the sixth grade.

Fall 1975 to Spring 1976 Title VII Impact

As was the case in the analyses of growth in achievement between fall 1975 and fall 1976, the findings derived from three different analytic methods were also used to "triangulate" on conclusions regarding Program impact between fall 1975 and spring 1976. The methods used to assess Title VII impact on gains from fall 1975 to spring 1976 for Hispanic students were standardized residual gain score analysis, analysis of covariance (ANCOVA), and comparison of pretest and posttest percentile ranks.

In general, the results of the three methods of Title VII impact analysis were supportive of each other. While there were instances of Title VII impact in some subjects in some grades, the overall-across-grade Total Title VII student analyses showed that Title VII does not appear to be having a consistent significant impact in meeting its goals as set forth in the legislation. In instances, such as the 4th grade, where

Title VII appears to be having a positive impact on English Reading, there was evidence that Title VII teachers were emphasizing the acquisition of English Language Arts skills in their classrooms and were themselves more English dominant. Relative to Title VII classrooms in the other grades, in fourth grade Title VII classrooms more time was being allocated to English Language Arts and less time was being allocated to Spanish Language Arts. Across grades when total Title VII and Non-Title VII Comparisons were made, the Title VII students in this Study appear to be doing poorer in English than the Non-Title VII students. In terms of Mathematics across grades, they appear to be performing about the same as Non-Title VII students.

Relative to national norms, Title VII Hispanic students across grades were performing at about the 20th percentile in English Reading and at about the 30th percentile in Mathematics.

Educational Processes and Outcomes

Analysis Approach

To examine the relationships between certain educational treatment characteristics and student outcome measures, several instruments which document the educational treatment received by a sample of the students in both the Title VII and the Non-Title VII comparison schools in the Study were developed. The development and use of these instruments were discussed in detail in Volume I. Teacher and Teacher Aide Questionnaires were also developed and administered as was a Parent Questionnaire.

The relationship between instructional process variables, teacher/teacher aide characteristics, and contextual characteristics, and gains in cognitive and attitudinal outcomes was analyzed by means of standardized gain score analysis. The analyses were based upon all students in the Impact Study's Intensive Sample for whom cognitive or attitudinal scores, process variables, teacher/teacher aide variables, and contextual variables were available. Since the objective of these process analyses was to assess the effects of various instructional strategies and to discover the more effective strategies for the kinds of students included in the Impact Study sample, the educational treatments of all the Intensive sample students, Title VII and Non-Title VII, were included.

Instructional Process Variables

Detailed educational treatment data were obtained through interviews and classroom observations for a subsample of the participating Title VII and Non-Title VII Comparison classrooms during the 1975-76 school year. Within the set of Title VII classrooms participating in the Impact Study, half were selected for this intensive analysis. In all, 161 classrooms were selected for intensive analysis, 120 of which were Title VII and 41 of which were Non-Title VII classrooms. All Title VII projects in the Study were represented in this intensive analysis subsample. Since the objective of these process analyses was to assess the effects of various instructional strategies and to discover the more effective strategies for the kinds of students included in the Impact Study Sample, the educational treatments of all the Intensive Sample students were included. These process analyses should not be viewed as an evaluation of all "bilingual education" processes since the sample of classrooms participating in the Intensive Sample and in the Impact Study were not chosen to be representative of the universe of classrooms implementing bilingual education practices but were by mandate of the Study restricted to Title VII Spanish/English bilingual projects and the comparison schools in the Study. However, because of the wide variety of instructional processes present in participating Title VII and Non-Title VII classrooms, it seems reasonable to assume that these analyses are fairly comprehensive and that they do represent findings that might be generalizable to students such as those involved in the educational processes analyzed.

English Language Arts Educational Processes. The standardized gain score analysis for English Language Arts educational processes did not show a completely consistent pattern for any of the process variables and outcomes across all the grades in the Study (grades 2 through 6). However, for three of the grades (3, 4, and 5), the Extent of Grouping was significantly positively related to gains in one or more of the measures used to assess English proficiency. That is, the greater the grouping and regrouping, the greater the gains. The number of hours per week devoted to English Language Arts instruction was positively related to English proficiency gains in grades 2 and 4, unrelated in grades 3 and 6, and negatively related in grade 5.

Mathematics Educational Processes. The relationships between Mathematics gains and hours per week devoted to Mathematics were the same across grades as those found for English Language Arts. That is, there was a significant positive relationship in grades 2 and 4, a negative relationship in grade 5, and no significant relationship either positive or negative for grades 3 and 6.

While the pattern is not complete across grades, it does appear that the more whole-class instruction there is, the less the Mathematics gains; and the more grouping or individualized instruction, the greater the gains. The positive relationship between Extent of Individualization and Mathematics gains was found in grades 2 and 4. Extent of Group Instruction and Mathematics gains were positively associated in grades 5 and 6, and the negative relationships between Extent of Whole-Class Instruction and Mathematics gains were found in grades 2, 5, and 6.

Spanish Use Permitted in Mathematics Class was positively related to Mathematics gains, in grade 2; however, there were no significant relationships between this variable and Mathematics gains at other grade levels.

Spanish Educational Processes. There was a consistent positive relationship between Extent of Grouping and gains in the Spanish as a Second Language test scores across most of the grades (2, 3, 4, and 6); and in grades 5 and 6 the Extent of Grouping was also positively related to the Spanish Reading test.

Average Spanish Hours per Student per Week was positively related to gains in the Spanish as a Second Language scores in grades 2, 3, and 4. There were no significant relationships between Hours per Week and SSL gains in grades 5 and 6. There were no significant relationships in any grade between Hours per Week in Spanish and the Spanish Reading test score gains.

Contextual Characteristics

There was very little consistency across grades in the relationship between the contextual variables--Home and Neighborhood Use of English and Proportion of Hispanic Students in the Classroom--and any of the outcome measures. The greater the Home and Neighborhood Use of English, the lower the gains in the Spanish as a Second Language scores in grades 3 and 4. The greater the Proportion of Hispanic Students in the Classroom, the greater the gains in the Spanish as a Second Language scores in grades 3 and 4.

Teacher and Teacher Aide Characteristics

The relationships between almost all of the characteristics of teachers and teacher aides and student outcome measures did not extend across more than one or two grades; and at times, a given characteristic was positively related with an outcome for one grade and negatively related for the same outcome measure for another grade. Teacher Non-Classroom Use of English was negatively associated with gains in the Spanish Reading test scores in two grades (3 and 4) and positively related to such gains in another grade (5). The opposite pattern was found between Teacher Non-Classroom Use of Spanish and gains in the Spanish Reading test (positively related in grades 3 and 4; negatively related in grade 5). There was no significant relationship between Teacher Non-Classroom Use of English and Teacher Non-Classroom Use of Spanish and Spanish Reading Score gains in the other two grades (2 and 6). Teacher Bilinguality was positively related to the Spanish Reading Score in only one grade; it was negatively related in another grade; and it had no relationship in the other grades.

Gains in Attitude Toward School, Attitude Toward English, and Attitude Toward Spanish were all generally unrelated to any of the Teacher Characteristics, with Teacher Overall Qualifications being unrelated in all grades, Teacher Bilinguality being related to these attitude gains in only one grade, Teacher Non-Classroom Use of English being related in only one grade, and Teacher Non-Classroom Use of Spanish being related in only one grade.

Teacher Characteristics, Teacher Overall Qualifications, Teacher Bilingual Qualifications, and Teacher Bilinguality were generally unrelated to gains in any of the English Reading Score or ESL Score gains. A given characteristic was related to an English Reading outcome gain in only one grade. For all the other grades, there was no significant relationship, either positive or negative.

Aide Bilinguality and Aide Bilingual Teacher Qualifications were also generally unrelated to English Reading Score or ESL Score gains; and the two relationships which were found were both negatively related to gains in grades 2 and 4. The Aide Non-Classroom Use of English and Aide Non-Classroom Use of Spanish (which can be thought of as some indication of the general language use pattern of the individual) each were related in only two grades, and the relationship for each was positive in one grade and negative in the other.

Mathematics Score gains were not related to any of the Teacher/Teacher Aide Characteristics across grades. Again, the relationship between a given characteristic and a Mathematics Score gain was sometimes positive for one grade and negative for another. Teacher Bilinguality was related to Mathematics gains in only one grade (4), and this relationship was negative. Aide Bilinguality was, however, positively related to Mathematics gains in two grades (3 and 5).

While Teacher Characteristics were found to be generally unrelated to gains in any of the attitude measures, Aide Characteristics were found to be positively related to Attitude Toward School gains in three grades (2, 4, and 5). The greater the Aide Non-Classroom Use of Spanish in these grades, generally, the greater the gain in Attitude Toward School.

It thus appears that teacher and teacher aide qualifications (overall and bilingual) and bilinguality characteristics have little relationship to English Reading Score or English as a Second Language Score gains. However, Aides who are more Spanish dominant, as reflected by their non-classroom use of Spanish, have a positive effect on gains in Attitude Toward School in three of the six grade levels in the Study. Teacher qualifications (overall and bilingual) and bilinguality also appear to have little relationship with Mathematics and Attitude Toward School, Attitude Toward English, and Attitude Toward Spanish gains.

I. INTRODUCTION

This volume is the third document related to the findings of the Evaluation of the Impact of the ESEA Title VII Bilingual Education Program. Volume I dealt with the basic design of the Study and presented findings related to the first year's data collection. Volume II contained detailed descriptions of the ESEA Title VII projects participating in the Study. These volumes were issued not only to provide interim results, but also to elicit comments and reviews to provide inputs for future analyses and reports.

In this volume we address primarily two areas: Section II contains a further examination of the impact of the Title VII Program; Section III discusses educational processes and outcomes related to Impact Study classrooms.

Section II examines the impact of Title VII from two perspectives. First, it presents the analysis of the fall 1975 to fall 1976 data. The students participating in this third data collection point (fall 1976) were a subsample of those involved in the fall 1975 to spring 1976 analysis. Secondly, it continues the analysis of the fall 1975 to spring 1976 data.

Section III of this volume analyzes the educational processes and outcomes which were documented for a subsample of Title VII and Non-Title VII students during the 1975-76 school year. The methods and procedures used during this documentation, which were discussed in Volume I, are reviewed in this section. The general paradigm for the Impact Study and the Impact Study documents related to the various data sources is illustrated below.

ANALYSIS SAMPLE	STUDENT TREATMENT AND GRADE										IMPACT STUDY DOCUMENT
	Title VII					Non-Title VII					
	2	3	4	5	6	2	3	4	5	6	
Total Impact Study Sample: Tested Fall 1975 and Spring 1976	X	X	X	X	X	X	X	X	X	X	Volume I Volume III
Intensive Impact Study Sample: Includes all Title VII and comparison sites, but a sample of classrooms and grades were selected for detailed educational treatment documentation during 1975-76 school years	X	X	X	X	X	X	X	X	X	X	Volume II Volume III
Impact Study Follow-On Sample: Sample of 1975-76 school year 2nd and 3rd grades followed into 1976-77 and tested fall 1976		X	X				X	X			Volume III

II. FURTHER EXAMINATION OF THE IMPACT OF TITLE VII

A. Fall 1976 Test Score Analyses and Findings

Objectives, Constraints, and Design of the Fall 1976 Test Score Analyses

Objectives and constraints. The original purpose for collecting student data in fall 1976 was to assess the impact of summer effects on the performance of students enrolled in a representative sample of second- and third-grade classrooms participating in the Impact Study. Thus, plans were made to implement fall 1976 testing during the first month of school in each of the schools chosen to participate in this Follow-On data collection effort. Unfortunately, it was not possible to adhere to this schedule because of the time required to obtain Office of Management and Budget clearance for the data collection instruments. The delay occurred even though the Follow-On data collection instruments were the same as those that had been granted clearance for use during the previous data collection points in the Study (i.e., during fall 1975 and spring 1976). Because of this unavoidable and unexpected delay, it was not possible to conduct the testing until November and December 1976. Since students were actually tested several months after the new school year had begun, it was no longer reasonable to consider analyzing the data to assess summer effects on student performance. Rather, it was jointly decided by AIR and USOE that these fall 1976 test data should be used as additional outcome measures by which the impact of Title VII could be evaluated via analyses of growth in achievement between fall 1975 and fall 1976.

Research design and sampling methodology. The sample of students to be tested during fall 1976 originally included those who during the previous school year (1) had been in the second or third grades and (2) were in classrooms selected for detailed educational treatment documentation.

The Intensive Sample. The classrooms that had been selected for educational treatment documentation during the 1975-76 school year comprise what has been called the Intensive Sample, since these classrooms were the object of intensive documentation efforts by AIR site visitors. Inclusion of classrooms in the Intensive Sample was based on an asymmetrical stratification sampling plan designed to limit the number of classrooms to approximately 50% of the total in the Impact Study. Within Title VII projects, half of the classrooms were randomly selected within each grade within each district. Where available, comparison classrooms were chosen as "matches" for the selected Title VII classrooms.

The Follow-On Sample. Although the original Follow-On Study design had called for the testing of all Intensive Sample second and third graders in fall 1976, budgetary constraints dictated a reduction in sample size. Thus, only about two-thirds of the sites with second- and third-grade classrooms in the Intensive Sample were selected for inclusion in the Follow-On Sample.

The reduction in the number of sites selected for the Follow-On data collection meant that some additional factors needed to be considered in selecting Follow-On Sample sites to help assure that this small sample would be fairly representative of the Impact Study Sample as a whole. First, an attempt was made to include in the Follow-On Sample one or more sites from every state participating in the Impact Study. Thus, if a state had only one site eligible for the Follow-On testing, that site was selected. Second, where a state had more than one site, each site was identified as rural or urban, and one or more sites were randomly selected from each category.

Once a Title VII project (i.e., site) had been selected for the Follow-On Sample, 1975-76 school year second- and third-grade Intensive Sample classrooms were then identified. "Matched" classrooms in Non-Title VII schools were selected where they were present. It is important to note that although the 1975-76 school year classroom was the sampling unit for the Follow-On Sample, it was actually the students in these classrooms that were identified for participation in the Follow-On testing. In other words, for testing purposes, students in the selected second- and third-grade classrooms were "followed" during the 1976-77 school year, regardless of whether or not they remained together in an intact classroom in fall 1976.

Testing was conducted using the same local data collection system established for the fall 1975 and spring 1976 testing. The selection, training, and duties of the local data collectors and test administrators were discussed fully in Volume I and will not be dealt with in this volume.

Because, as noted previously, the fall 1976 tests could not be administerd until November/December 1976, it became necessary to verify the Title VII or Non-Title VII status of the Follow-On students.

Participating schools verified each Follow-On student's status as either a Title VII student or a Non-Title VII student during the two to three months of the 1976-77 school year preceding the fall 1976 testing.

Sample Selection Issues

Because of the relatively small size of the Follow-On Sample and because of the existence of attrition between the 1975-76 (Year One) and 1976-77 (Year Two) school years, a necessary first step in all analyses was an evaluation of the extent to which the sample of students analyzed was similar to the larger group from which it was selected. In this case, the larger group did not consist of all students in the Impact Study data base.* Rather, only those students who were present in fall 1975 and spring 1976 were considered. These students were selected as the reference group of interest because their presence during both the fall 1975 and spring 1976 testing sessions suggested that they were present during the interval between testings and were, therefore, exposed to the treatments of interest (i.e., Title VII or Non-Title VII) during the major portion of Year One. It was assumed that students who were present for the fall 1975, spring 1976, and fall 1976 data collection were members of their respective Title VII or Non-Title VII classrooms while school was in session between those dates.

---

*As discussed in Volume I (Chapter VI) and as shown in Appendix VI-D in Volume I, the total number of students in the Impact Study data base was equal to the number of students who were present in fall 1975 or in spring 1976. Thus, the total number of students includes students who may not have been present during both the fall 1975 and spring 1976 testing.

A later section of the report (characteristics of the Fall 1976 Test Score Analysis Samples) shows the numbers of second- and third-graders present in the Impact Study data base who were present during both the fall 1975 and spring 1976 test administrations. (Presence during a given test administration was defined by the presence of at least one correct item on any of the cognitive tests given.) Also presented are the numbers of students who were chosen during the various selection stages used in defining the analysis samples for the Follow-On analyses. As will be mentioned later, when all practical constraints are considered together (e.g., Year One/Year Two changes in educational treatment group membership, attrition, etc.), it is most appropriate to view the subgroup of Title VII students included in the Follow-On analyses as a special subpopulation within Title VII. Whether or not the findings can be generalized to the Title VII Program as a whole thus becomes more a matter of judgment than of statistical theory. Information provided in this report, however, does describe the kind of students who were included in these analyses and does permit an evaluation of the similarities and differences between students who were included in the fall 1976 test score analyses and those who were not included. It is assumed that the greater the similarity between such groups, the greater the likelihood that the findings can be generalized or extrapolated to all Title VII students and not just to those students who comprise a specific subpopulation within Title VII.

Ethnicity of the Students Analyzed

All descriptive procedures and all fall 1976 test score analyses were based only on the data provided by students who had been identified as Hispanic by their teacher(s). This was done because the numbers of white non-Hispanic, black, and other students that could have been included in these analyses were very small. Findings based on very small, nonrandom samples are questionable at best. In addition, since Hispanic students comprised the target population for the Title VII projects sampled by this study, focusing our analyses on Hispanic students seemed entirely appropriate.

Longitudinal Data Requirements

The analyses for a given outcome variable were based only on those students who had a particular fall 1975, spring 1976, and fall 1976 test score (i.e., students with incomplete data with respect to a particular test score were not included in the analyses for that score). Although spring 1976 test scores were not involved directly in these analyses of fall 1975 to fall 1976 growth in achievement, presence of a spring 1976 test score was required because we wanted the students in the fall-to-fall analyses to be a subset of those who would have been included in fall-to-spring analyses (such as those discussed in Volume I and in Sections II-B and III of this report).

Analysis Variables: Outcomes

The analysis variables used in the analyses of the fall 1976 test score data were largely those used and discussed in Volume I. Since the objective of the fall 1975 to fall 1976 analyses was to corroborate (in a small number of classrooms over a longer interval of time) other findings regarding Program impact during the 1975-76 school year, Title VII Program impact was evaluated with respect to four achievement dimensions: (1) English Reading, (2) Mathematics, (3) Spanish Reading and (4) English as a Second Language and aural comprehension. The test scores that measured each of these dimensions are briefly reviewed next. A more complete discussion of the instruments from which these scores were derived is contained in Volume I, Chapters III and IV.

English Reading. English Reading achievement was measured by the Reading tests of Levels C, 1, or 2 of the Comprehensive Tests of Basic Skills (CTBS), 1973 Edition. Students were given grade level tests unless they had been designated as Spanish monolingual for test-taking purposes. Such students, regardless of their grade level, were always given Level C CTBS Reading tests. (They were also given an English aural comprehension test discussed later.)

Three CTBS Reading scores were analyzed:

- CTBS Reading Total Expanded Standard Score (also called the English Total Reading Score in this report)

- CTBS Reading Total Expanded Standard Score (Rescored) [also called the English Total Reading Score (Rescored) in this report]
- CTBS Reading Vocabulary Expanded Standard Score (also called the English Reading Vocabulary Score in this report)

The CTBS Reading Comprehension subtest score was not included in these analyses because Level 1 and Level 2 of the CTBS have a single Reading Comprehension subtest and score and because Level C of the CTBS has two Reading Comprehension subtests and two scores. Since most CTBS test score analyses involved scores derived from more than one level of the test (because of the necessity for out-of-level testing), it was not possible to identify a single score which, for all students in a given analysis, could be called a Reading Comprehension score.* Also, time constraints, the small numbers of students involved in the fall 1976 test score analyses, and the exploratory nature of these analyses suggested that conducting analyses for additional subtest scores would not be feasible.

CTBS Expanded Standard Scores. The CTBS Expanded Standard Scores have been discussed in greater detail in Volume I. In brief, the CTBS Expanded Standard Score Scale was developed by the test publisher, CTB/McGraw-Hill, and is assumed to represent an equal-interval score scale. According to the test publisher, students can take different forms and levels of the CTBS Forms S and T, and this score scale will permit them to be placed on the same dimension of achievement.

The CTBS Reading Total Expanded Standard Score (Rescored) was also discussed in Volume I. In brief, it is a CTBS Reading Total Expanded Standard Score based on the number of CTBS Form S, Level C, Reading test items answered correctly. It differs from the Reading Total Expanded Standard Score provided by the test publisher only for those students who took the CTBS Form S, Level C, and who did not complete all three Reading subtests (Reading Vocabulary; Reading Comprehension: Sentences; and Reading Comprehension: Passages). Since the test publisher's scoring rules are such that a Reading total score is computed only when all subtests have valid or nonblank scores, the rescoring procedure implicitly assumes that, had the student been given the subtest, he or she would have answered no items correctly. Although this sounds somewhat implausible, such an approach would be justified if (1) the reason for missing subtest scores was that teachers had correctly assessed that certain students could not have answered any of the items correctly because of the students' limited skills in English Reading and (2) no guessing would have occurred had these students been given the test with the standard administration procedures provided by the test publisher. In any case, if these assumptions were not completely tenable, it is likely that this rescoring procedure would have increased observed gains in test scores rather than decreased them because there were more blank subtests at pretest time than at posttest time.

---

*The one exception was grade 2 during fall 1975 when all students were given the CTBS Form S, Level C.

Mathematics. Mathematics achievement was measured by the Mathematics tests of the CTBS. As described more fully in Volume I, students were given either the standard English version of the CTBS Mathematics tests or a Spanish translation of these same tests. Each student's teacher determined whether the English version or the Spanish translation was most appropriate for him/her. Only grade-level Mathematics tests were administered.

Only one CTBS Mathematics test score was analyzed for the fall 1976 Follow-On analyses, the Mathematics Computation Expanded Standard Score. (Also called the Mathematics Computation Score in this report). As was noted with respect to the CTBS Reading scores, Expanded Standard Scores are assumed to represent an equal-interval score scale.

CTBS test score transformation. As will be discussed later, use of analysis of covariance (and standardized gain score analysis) requires that the relationship between covariates and posttest within Title VII and Non-Title VII groups be similar. In some analyses this was not found to be true. Therefore, a test score transformation was developed for the CTBS test scores that assumed that non-homogeneous within-group regression was due to Title VII/Non-Title VII differential guessing effects on the tests. The transformation, on a priori grounds, was designed to correct such heterogeneity in observed test scores, given that guessing on the tests was the reason for the problem. This transformation and its rationale is discussed fully in Appendix II-A-1. Transformed test score variables were used in analyses of covariance procedures for CTBS scores when the conditions for the transformation were applicable (see Appendix II-A-1).

Spanish Reading. Spanish Reading was measured by the Prueba de Lectura. The only score derived from this test that was analyzed for this report was the Prueba de Lectura Total Raw Score (also called the Spanish Reading Score in this report). As discussed more fully in Volume I, this score was equal to the number of lexically unbiased items that had been answered correctly.

English as a Second Language (ESL). The Prueba de Comprensión Auditiva-Inglés was used to measure the English aural comprehension of those students judged by their teachers to be monolingual English for test-taking purposes. The Prueba de Comprension Auditiva-Ingles Total Scaled Score derived from this test was viewed as a measure of English as a Second Language skills and also called the ESL Score in this report. "Scaled Scores" were developed by the test developer, Educational Testing Service, by methods similar to those used by CTB/McGraw-Hill in their development of the CTBS Expanded Standard Score Scale. As such, therefore, they are assumed to represent an equal-interval measure of ESL aural comprehension.

It should be noted that this test was originally designed for use in Puerto Rico. Also, the data used to develop Scaled Scores were gathered only in Puerto Rico. However, because the skills being assessed by this test were standard English listening skills, it was felt that Scaled Scores derived from the test would not be affected by Hispanic subgroup differences.

Analyses Variables: Covariates

Pretest scores. Fall 1975 (pretest) and fall 1976 (posttest) scores were used in all analyses. Title VII/Non-Title VII differences on pretest were used to adjust posttest differences by means of two different statistical procedures to be discussed later. In addition to pretest, two other indices were used as covariates in these analyses, student socioeconomic status and approximate number of school days intervening between the student's fall 1975 test date and the fall 1976 test date.

Student Socioeconomic Status score. The student Socioeconomic Status score was discussed fully in Volume I. In general, it is a measure of the educational and occupational level of the child's parents (or heads of household).

The approximate number of school days intervening between the students' fall 1975 testing date and the fall 1976 testing date. The index for approximate number of school days between pretest and posttest was developed in the following manner:

- The midpoints of the testing dates for groups of students were compiled on the basis of all information provided by project staff and by local data coordinators during the course of the study. The dates used were for the smallest group possible on which such information was available. These ranged from dates for subgroups of students within classrooms in some sites to all students in a site for other sites.
- A list of school opening and closing dates was developed for the 1975-76 school year. School opening dates in fall 1976 were also noted.
- Each date was converted to a numerical testing date by (1) assigning consecutive integers to different months, where August 1975 was month 1 and December 1976 was month 17 (see Appendix II-A-2), (2) averaging the number of calendar days per month for the 17-month period, August 1975 through December 1976, (3) converting day-of-the-month to a proportion by dividing each date by the average number of calendar days per month, and (4) adding this proportion to the numerical month-of-testing date.
- The approximate number of school calendar months between fall 1975 and fall 1976 testing was equal to the end of Year One minus the fall 1975 test date plus the fall 1976 test date minus the beginning of school date for Year Two.
- The average number of non-weekend days per month for the 17-month period, August 1975 through December 1976, was computed.

- The approximate number of school days between fall 1975 and fall 1976 testing was computed by multiplying the number of school calendar months between fall 1975 and fall 1976 by the average number of non-weekend days per month. Depending upon the specific test dates involved, ten days were subtracted for winter (i.e., Christmas) vacation and five days for spring (i.e., Easter) vacation.

Analysis Variables: Title VII Classroom Enrollment and Community Type

Two Title VII/Non-Title VII treatment variables were examined in the Follow-On analyses. One variable (Title VII [pooled]) simply differentiated between the student's membership in a Title VII or a Non-Title VII classroom. The second treatment variable differentiated Title VII projects located in communities for whom LEA staff had identified a local Non-Title VII comparison classroom from Title VII projects located in communities for which no local Non-Title VII comparison classroom had been identified.

Analysis Variables: Descriptive Characteristics

In addition to the outcomes, covariates, and treatment variables just noted, the descriptive variables described in Volume I were also used to identify the kinds of students who were analyzed or those who, for one reason or another, were not included in the fall 1976 test score analyses.

General Analysis Approach

The essential problem in analyzing survey data like those collected by the Impact Study is that the processes by which students became members of a particular group are unknown. Without random assignment of students to treatments there simply is no entirely adequate way to guarantee that students who received the special treatment did not differ systematically (in known or unknown ways) from students who did not receive the special educational treatment. Thus, without true random assignment, one possible explanation for a posttreatment difference among groups is that some unknown factor confounded with group membership is the real underlying "cause" for the results obtained. There is nothing magical or fair about randomization--it merely guarantees that the student composition of groups to be compared does not differ systematically (within the limits of sampling error) in known or in unknown ways.

Because the comparability of Hispanic Title VII students and Hispanic Non-Title VII students could not be assured through random assignment of students to educational treatments (a limitation of virtually all large-scale educational evaluations), the evaluation of Title VII Program impact based upon test score data gathered in fall 1976 involved a number of different analytic methods. As with other analyses conducted for the Impact Study, the basic assumption underlying this approach was that the convergence of results across different methods, grade levels, and variables provided evidence that a given finding was not method- or assumption-dependent. In short, our basic analytic strategy was to look for meaningful patterns of results involving different methods, different age/grade ranges, and independent sources of data (to the extent possible) and to "triangulate" on those conclusions that, in our judgment, appeared to be reasonably justifiable. As in all other analyses concerning Title VII impact, the question being explored was whether or not the fall 1975 to fall 1976 growth in achievement for Title VII Hispanic students was greater than that expected in absence of a special Title VII educational treatment.

Evaluation design. The basic design employed by the Impact Study was, as described more thoroughly in Volume I, a two-group pretest/posttest design in which the growth of students enrolled in Title VII-funded classrooms was to be compared with that of similar students enrolled in Non-Title VII, non-bilingual education classrooms. Unfortunately, because of community practices regarding the student composition of Title VII-supported classrooms and because of legal constraints involving segregation, Non-Title VII, non-bilingual education classrooms containing students similar to those served by Title VII could not always be identified at each site. Since students enrolled in such Non-Title VII schools/classrooms were used to form the Comparison group in all impact analyses, it became necessary to ascertain if there were notable systematic differences among sites that had or had not identified comparison schools or classrooms. If comparison classrooms were located in a clearly definable subset of sites, then, it was possible that the growth of such Non-Title VII students might not form a completely appropriate "benchmark" group against which to evaluate the growth of all

Title VII students. Our general analysis approach, then, was formulated in a way that would permit us if necessary, to take such differences into account and would allow us

- To conduct appropriate Title VII/Non-Title VII comparative analyses
- To identify the assumptions that were necessary in making program-level inferences from a given set of comparative analyses

The revised evaluation design can be described by the following figure in which classrooms and students had been sampled in only three of the four cells:

	Community Type	
Treatment	With Comparison (Type WC)	Without Comparison (Type NC)
Title VII	Cell 1	Cell 2
Non-Title VII	Cell 3	▨

Since community type is defined by whether or not "matched" Title VII and Non-Title VII classrooms were sampled, the Non-Title VII Type NC cell was, by definition, blank. The reasons for lack of comparison schools and classrooms in some communities were discussed in Volume I.

Within this design, it is clearly possible to compare the outcome of Title VII treatment to what it might have been without treatment, within Type WC (with comparison) communities. Overall comparison involving Title VII classrooms, from both community types, however, depends on additional assumptions. First, if we make the assumption of no interaction (the effect of Title VII treatment would be the same in both types of communities), then a Title VII/Non-Title VII comparison within Type WC communities would suffice as an overall Title VII/Non-Title comparison. Second, we can make the (weaker) assumption that, if there are no significant differences in the effectiveness of the Title VII project treatments between communities of Types WC and NC, there are not likely to be differences in the effectiveness of Non-Title VII project treatments between communities of Types WC and NC. The rationale for this assumption is that any differential effectiveness of Title VII treatments between community types would be mediated by some community variable which would also have some significant effect--but maybe of a different size--on the effectiveness of the Non-Title VII treatment. Given this assumption, if community type had no effect on Title VII outcomes, Title VII scores could be pooled and compared with Non-Title VII scores.

Neither of these assumptions provides for a truly adequate substitute for comparison schools from both types of communities. However, each assumption does allow for a useful assessment of Title VII effectiveness. To have obtained comparison schools in all sites, it would have been necessary to substantially alter the program design in some communities, an endeavor far beyond the mandate for this study.

In certain cases where Title VII treatments had different effects in Type WC and NC communities, a further comparison was made between two groups--Title VII classrooms in Type NC communities versus Non-Title VII classrooms in Type WC communities. This was primarily for descriptive purposes. For example, suppose that in Type WC communities Title VII and Non-Title VII treatments were equally effective but that the positive impact of Title VII treatment in Type NC communities was substantial. Then one could reasonably entertain the possibility that, had comparison classrooms been available in all communities, Title VII might have been shown effective overall. If, on the other hand, the Title VII treatments in type NC communities were significantly less effective than either Title VII or Non-Title VII treatments in Type WC communities, it is more doubtful that the universal availability of comparison classrooms would have improved the overall standing of Title VII versus Non-Title VII classrooms, compared to the results obtained in Type WC communities alone.

Preliminary analyses, in fact, showed that presence or absence of an identified Non-Title VII classroom was confounded with geographic area and Hispanic subgroup. Title VII classrooms with identified Non-Title VII comparison classrooms (community Type WC) were usually located in the western or southwestern region of the United States and were composed of students whose Hispanic background was Mexican-American. On the other hand, Title VII classrooms with no identified Non-Title VII comparison classrooms (community type NC) were mainly located in the eastern or northeastern region of the United States and were largely composed of students whose Hispanic background was Puerto Rican-American. This being the case, the community type variable could not be ignored.

Statistical Procedures Used

Program impact was analyzed by means of three different comparative approaches:

- Regression analysis and analysis of covariance (ANCOVA)
- Standardized gain score analysis and partial correlation analysis
- Comparison with CTBS national norms

Each analysis was preceded by a number of preliminary analyses that permitted an assessment of whether or not the technique's statistical assumptions were tenable. Analytic methods are reviewed in the remaining paragraphs of this section.

Analysis of covariance (ANCOVA). As discussed previously, there are no theoretically adequate methods for comparing the performance of groups formed through nonrandom processes. The only exception occurs when all factors involved in assigning students to groups are known--a highly unlikely state of affairs in field studies. One of the most popular solutions to this difficulty in applied research undertaken in public schools is to ascertain whether the student composition of the groups to be compared is relatively similar so that is is reasonable to assume that group membership is random in effect (Lord, 1967). This approach, for example, underlies the comparison group model currently proposed for use in evaluating Title I projects (Tallmadge and Wood, 1976:50).

> For assignment to be random in effect, it must be reasonable to assume that the treatment and control groups are, in essence, random samples from a single

> population. To be considered random in effect, both groups of children must be similar in terms of socioeconomic status, age, sex, and racial composition, and they must attend schools which are similar in size and setting.

Furthermore, the method of selecting comparison group students should be similar to the method used to select Title VII students to avoid differential "regression-to-the-mean" effects in the two groups. Perhaps the most important characteristic to consider is students' pretest scores, since group differences on the posttest are used to evaluate Program impact.

When pretreatment differences among groups to be compared are small or unsystematic so that it is reasonable to assume that the two groups can be considered to be random samples from the same population (prior to the treatment), then, analysis of covariance (ANCOVA) can be used to adjust posttest differences for known group differences existing prior to exposure to the treatment. The analyses of fall 1976 test score data used three variables as covariates:

- The student's fall 1975 test score (pretest)
- The student's socioeconomic status (SES)
- The approximate number of school days (NDAYS) intervening between the fall 1975 testing date and the fall 1976 testing date for that student

It is important to note that ANCOVA and standardized gain score analysis (described next) assume that the pretest measure is actually a measure of pretreatment achievement level. Because prior participation in Title VII may have had some impact on achievement and because pretest scores may reflect this, the analyses conducted for the Impact Study cannot be viewed as providing evidence for the impact of Title VII during previous school years. Rather, the treatment of interest in this study was the impact during the interval between pretesting (fall 1975) and posttesting (fall 1976).

Standardized gain score analysis. Many researchers have shown that when two groups compared with each other cannot be considered to be random samples from the same population (prior to treatment and pretesting), the ANCOVA will undercorrect for systematic pre-existing test score differences among the groups. This argument, of course, applies to the situation in which the special treatment is given to the initially low scoring group, an expected occurrence in evaluations of compensatory education programs. Because so many authors have discussed this particular problem in using ANCOVA, there seems little doubt that such regression artifacts can occur. O'Connor (1973), as well as others, have also shown that "matching" suffers from the same kind of regression artifact.

Because of the possibility that the Title VII and Non-Title VII groups to be compared could not be considered to be, even on a practical level, random samples from the same population (or from populations that behave similarly), an analytic alternative to ANCOVA was desired.

Standardized gain score analysis, a procedure described fully by Kenny (1975), was selected as such an alternative analytic approach. It also permitted us to adjust gains for the same covariates that were used in the ANCOVA analyses-covariates which, on a priori grounds, we believed should be considered in all Title VII/Non-Title VII comparative analyses (i.e., student socioeconomic status and approximate number of school days between fall 1975 and fall 1976 testing). Kenny has shown that if pre-existing differences (i.e., mean differences between Title VII and Non-Title VII groups on the pretest) can be assumed to remain constant over time, group mean differences on the posttest can be adjusted appropriately by use of standardized gain score analysis. He advocates standardized gain score analysis because separate standardization of all pretest scores (Title VII and Non-Title VII alike) and all posttest scores will equate the variances of these two distributions of scores. Since it can be shown that correlations are indices of the degree of relationship between two of paired standard scores, he shows that standardized gain score analysis can be implemented by comparing the correlation of pretest and treatment group membership (coded as a binary variable) with the correlation of posttest with treatment group membership. Because treatment is a binary coded variable, such correlations become point biserial correlations and are, in fact, an index of the mean difference (in standard deviation units) among the two groups on the continuous variable (in this case, pretest or posttest). Kenny also describes how such an approach can take into account additional background variables or covariates. When this is done, the analyses, in effect, become standardized residual gain score analyses.

As suggested above, the standardized residual gain score analyses were implemented by means of a computational procedure described by Kenny (1975). He suggests that the background variables to be used as covariates should be chosen on a priori grounds and that "partial correlations of the treatment with the pretest and the posttest, with the background variables partialed out" (p. 353) should be compared. "Partial correlations are compared instead of partial regression coefficients because of the assumption of stability of variance over time; that is, the variability of the dependent variable that is not explained by the background variables is stable over time" (p. 353). Thus, we computed two partial correlations, one between treatment group membership and pretest (with student socioeconomic status and number of school days fall 1975 to fall 1976 partialed out) and one between treatment group membership and posttest (with the same covariates partialed out). These were compared with each other by means of a t test for correlated correlations in which the partial correlation of pretest with posttest (with the same covariates, student socioeconomic status, and number of school days between fall 1975 and fall 1976) was partialed out.

Norm-referenced analysis. The third analytic method used to evaluate Title VII impact involved transforming each CTBS test score group mean to a percentile rank (using published norms) and comparing the posttest percentile rank with that for the pretest. This procedure and some of the issues involved in implementing such analyses were discussed more fully in Volume I. In spite of the fact that caution needs to be exercised when using norms that have been derived by interpolation (such as CTBS norms for fall testing), it was felt that an analytic approach that was not dependent upon comparisons with the Study's Non-Title VII students would be advisable. Furthermore, since the Follow-On analyses involved fall-to-fall comparisons, it was felt that any biasing factors due to use of interpolated fall norms would probably not differentially affect the estimate of growth. The only way in which the norm-referenced analyses for this volume differed from those for Volume I was that average time of testing was taken into account here. Time of pretesting and posttesting was computed as part of the computations for approximate number of school days between fall 1975 and fall 1976 testing described previously.

Program Impact Hypotheses

Analyses of Program impact and the strategies and assumptions inherent to them were intended to address three major questions and a number of subquestions. These were as follows:

Question 1. In communities with comparison classrooms only (Type WC) are the Title VII treatments more effective, less effective, or equally effective, compared to the Non-Title VII treatments in those same communities?

> Subquestion 1.A. Are the regression slopes of posttest scores on covariables significantly different between the two groups?
>
> > If no, go ahead. If yes, check whether use of transformed scores is appropriate, and if so, ask Subquestion 1.A in terms of transformed scores; if differences persist, no answer to Question 1 is possible using ANCOVA with these data.
>
> Subquestion 1.B. Are the regression intercepts significantly different between the two groups?
>
> > If yes, the group with the higher intercept (i.e., adjusted posttest mean) appears to be more effective. If no, the two groups are equally effective.

Question 1 is answered. Assuming that there is no interaction between community types and treatment across all communities, these findings for Type WC communities could then be generalized to all community types.

Question 2. Overall, are the Title VII treatments more effective, less less effective, or equally effective, compared to Non-Title VII treatments?

> Subquestion 2.A. Are Title VII treatments in communities without comparison classrooms (Type NC) equally as effective as Title VII treatments in communities with comparison classrooms (Type WC)?
>
> > Subquestion 2.A.i. Are the regresssion slopes of posttest scores on covariates significantly different between the two Title VII groups?
> >
> > > If no, go ahead. If yes, re-try, if possible, using transformed scores. If differences persist, no answer to Question 2 is possible using ANCOVA with these data.

Subquestion 2.A.ii. Are the regression intercepts significantly different between the two Title VII groups?

If no, the answer to Question 2.A is yes; go ahead. If yes, no answer to Question 2 is possible using ANCOVA with these data; go to Question 3.

Subquestion 2.B. Pooling all Title VII sites, are Title VII treatments more effective, less effective, or equally effective, compared to Non-Title VII treatments?

Subquestion 2.B.i. Are the regression slopes of posttest scores on covariates significantly different between Title VII pooled and Non-Title VII groups?

If no, go ahead. If yes, re-try, if possible, starting with Question 2.A, using transformed scores. If differences persist, no answer to Question 2 is possible using ANCOVA with these data.

Subquestion 2.B.ii. Are the regression intercepts significantly different between Title VII pooled and Non-Title VII groups?

If yes, the answer to Question 2 is that the treatment with the higher intercept (i.e., adjusted posttest mean) is more effective. If no, the answer to Question 2 is that the two treatments are equally effective.

Question 2 is answered. Assuming that if Title VII performance is the same across community types and it is legitimate to pool the Title VII data from Type WC and Type NC communities (an assumption actually tested), then Non-Title VII performance would also have been the same across community types, and these findings could be generalized to all community types.

Question 3. Are Title VII treatments at sites with or without comparison classrooms (Types WC and NC respectively) more effective, less effective, or equally effective, compared to Non-Title VII treatments at sites with comparison classrooms (Type WC communities)?

Subquestion 3.A. Are the regression slopes of posttest scores on covariates significantly different between the two Title VII groups* and the Non-Title VII group?

---

*The analysis model used here assumes that the covariate-on-posttest regression slopes for the two Title VII groups are equal, an assumption actually tested in subquestion 2.A.i.

If no, go ahead. If yes, re-try, if possible, with transformed scores. If differences persist, no answer to Question 3 is possible using these data.

Subquestion 3.B. Are the regression intercepts significantly different between the Title VII groups and the Non-Title VII group?

If yes, the treatment for the group with the higher intercept is more effective. If no, the treatments are equally effective.

Question 3 is answered. Assuming that the performance of Non-Title VII in Type NC communities can be estimated by that of Non-Title VII students in Type WC communities, this analysis will allow one to rank order the Title VII treatment in Type WC and Type NC communities.

All tests for slope or intercept differences relative to Non-Title VII treatment in the Type WC community that had to have the outcome of "no statistically significant difference" to proceed, used the .10 level of significance (two-tailed); that is, any difference large enough that it would occur fewer than one time in ten by chance was taken as grounds for not proceeding. All tests for significant difference which related directly to Program effectiveness (Questions 1.B, 2.B.ii, and 3.B) used the .05 level of significance (two-tailed).

Characteristics of the Fall 1976 Test Score Analysis Samples

Identification of students included in Follow-On analysis samples. The first column of Table II-A-1 describes the progressive decisions that were implemented in selecting specific students for the fall 1976 test score analyses. The other columns of the table show the numbers of students selected at each sample definition/selection stage. As shown, of the students tested during fall 1976, the students of interest for the present analyses were those who

- had been in a Title VII or a Non-Title VII classroom during the 1975-76 school year (defined by their having been present for Impact Study testing during both fall 1975 and the spring 1976

- had the same Title VII or Non-Title VII status during the 1975-76 school year and during the fall of the 1976-77 school year
- had complete fall 1975, spring 1976, and fall 1976 data for one of six different outcome measures

Those students who were tested but who did not meet the above criteria were not included in the Follow-On analysis group.

Table II-A-1 also shows the numbers of students in grades 2 and 3 who were selected at each sample definition/selection stage. The numbers of students selected at each of the successive constraints that were imposed in defining/selecting the Follow-On analysis sample is noted with the corresponding number of students in each of the subsamples. Examination of Table II-A-1 shows that very small numbers of white non-Hispanic, black, and other students could be included in these analyses. Therefore, it was decided that all subsequent analyses conducted on the fall 1976 test data would be restricted to Hispanic students. For this reason, the descriptive statistics presented in Tables II-A-2 (on the following page) and II-A-3-3a through II-A-3-13a in Appendix II-A-3 refer only to the Hispanic students in the Follow-On and Non-Follow-on Samples.

Table II-A-2 shows the number of Title VII and Non-Title VII Hispanic Follow-On Sample students in grades 2 and 3 (as of the 1975-76 school year) with complete fall 1975, spring 1976, and fall 1976 data for each of the six outcome variables of interest. The sample sizes presented show the numbers of students with a complete set of English Total Reading Scores, a complete set of English Total Reading Scores (Rescored), a complete set of English Reading Vocabulary Scores, a complete set of Mathematics Computation Scores, a complete set of Spanish Reading Scores, and a complete set of ESL Scores. The small numbers of students with complete Preuba de Lectura and ESL test scores were undoubtedly due to the fact that these instruments were judged to be inappropriate for many students in the sample.

Characteristics of students in these samples. Because of the sampling and selection procedures discussed in the previous section, it was important to determine the extent to which Follow-On Sample students were similar to those who were present in the Impact Study data base during fall 1975 and

TABLE II-A-1

Sample Selection Stages and Numbers of Students by Ethnic Group-- Fall 1975 to Fall 1976 Achievement Analyses, Grades 2 and 3

	Grade 2				Grade 3			
	Hispanic	Non-Hispanic White	Black	Other	Hispanic	Non-Hispanic White	Black	Other
Impact Study Data Base[a]								
Title VII Pooled	1080	102	92	210	1319	174	120	188
With Comparison	401	43	35	27	799	102	49	54
Without Comparison	679	59	57	183	520	72	71	134
Non-Title VII	447	123	65	60	650	188	83	77
Students Present During Fall 1975 and Spring 1976								
Title VI Pooled	813	79	74	90	1031	132	89	118
With Comparison	333	30	30	15	660	72	34	25
Without Comparison	480	49	44	75	371	60	55	93
Non-Title VII	321	92	50	33	520	125	61	43
Students Present in Follow-On Designated Classrooms								
Title VII Pooled	277	26	16	27	324	41	19	27
With Comparison	61	4	0	0	180	23	5	2
Without Comparison	216	22	16	27	144	18	14	25
Non-Title VII	71	20	3	9	102	17	22	4
Students Present During Fall 1975 and Spring 1976 and Fall 1976								
Title VII Pooled	242	23	16	25	211	20	18	11
With Comparison	50	4	0	0	94	9	5	2
Without Comparison	192	19	16	25	117	11	13	9
Non-Title VII	64	4	2	0	61	11	10	4
Students Who Were Enrolled Consistently in Title VII or Non-Title VII During Years 1 and 2								
Title VII Pooled	184	20	16	24	187	12	14	10
With Comparison	50	4	0	0	71	4	2	1
Without Comparison	134	16	16	24	116	8	12	9
Non-Title VII	64	4	2	0	59	11	10	4
Students With Complete Data for One of the Six Outcome Variables of Interest								
Title VII Pooled	145	16	13	17	166	11	14	10
With Comparison	44	3	0	0	63	4	2	1
Without Comparison	101	13	13	17	103	7	12	9
Non-Title VII	57	4	2	0	56	11	10	4

---

[a] The total number of students shown for the Fall 1975 to Fall 1976 Achievement Analyses does not include the Non-Title VII comparison classroom students who were tested only in fall 1975 in Dallas, Texas, and does not include students from the Virgin Islands.

TABLE-A-2

Number of Title VII and Non-Title VII Hispanic Students with Complete Data for Each of the Six Outcome Variables of Interest--Fall 1975 to Fall 1976 Achievement Analyses, Grades 2 and 3

	Grade 2	Grade 3
Students with Complete Reading Total Score Data		
Title VII Pooled	107	113
With Comparison	39	59
Without Comparison	68	54
Non-Title VII	54	55
Students with Complete Reading Total Score (Rescored) Data		
Title VII Pooled	116	123
With Comparison	43	59
Without Comparison	73	64
Non-Title VII	56	55
Students with Complete Reading Vocabulary Score Data		
Title VII Pooled	117	123
With Comparison	44	59
Without Comparison	73	64
Non-Title VII	56	55
Students with Complete Mathematics Computation Score Data		
Title VII Pooled	133	151
With Comparison	40	56
Without Comparison	93	95
Non-Title VII	53	55
Students with Complete Prueba de Lectura Score Data		
Title VII Pooled	74	70
With Comparison	20	24
Without Comparison	54	46
Non-Title VII	1	0
Students with Complete ESL Score Data		
Title VII Pooled	45	54
With Comparison	10	7
Without Comparison	35	47
Non-Title VII	1	0

spring 1976 and who were not selected for the Follow-On Sample and analyses. This would permit some assessment of whether or not the Follow-On sample could, for all practical purposes, be considered a representative sample of all Impact Study students who were present during the 1975-76 school year. Since later analyses distinguished between Title VII With Comparison classrooms, Title VII Without Comparison classrooms, and Non-Title VII classrooms, these distinctions were maintained in all the descriptive analyses presented here.

Follow-On and Non-Follow-On Title VII and Non-Title VII groups were compared in terms of the following characteristics:

- Geographic distribution in the United States
- Major Hispanic group making up the test group
- Distribution of bases for presence in Title VII program
- Percentage of students for whom the 1975-76 school year was the first in a continental United States school
- Average student prior exposure to bilingual education
- Average student age
- Average student socioeconomic status
- Average number of school days students were absent between fall 1975 and spring 1976 test dates
- Average teacher assessment of students' speaking ability in English and Spanish
- Average student assessment of own ability to understand and to speak English
- Average student assessment of own ability to understand and to speak Spanish

The results of these computations are shown in Appendix II-A-3, Tables II-A-3-3a through II-A-3-13a.

Geographic distribution. Appendix II-A-3, Table II-A-3-3a shows that for both grades, the large majority of Follow-On students were either (1) at sites with comparison schools in the Southwest or (2) at sites without comparison schools in the Northeast. Along with a few second-grade students at sites in the West, these accounted for 85% of the Follow-On Sample. In the Non-Follow-On Sample these three types of sites accounted for only 52% of the second-grade cohort and only 72% of the third-grade cohort. The other notable difference between the Follow-On and Non-Follow-On Samples was the omission of sites in the West from the third-grade cohort of the Follow-On Sample.

In general terms, the Follow-On Sample was a specific subsample of the sample used for fall-to-spring analyses and was less balanced across geographic regions than was the sample used for fall 1975 to spring 1976 analyses reported in Volume I.

Ethnic groups among Hispanics. Appendix II-A-3, Table II-A-3-4a shows the numbers and percentages of students by Hispanic subgroup for the Follow-On and Non-Follow-On Samples. Nearly 100% of the Title VII With Comparison Follow-On students are Mexican-American for this grade and 100% of the Non-Title VII Follow-On students are also Mexican-American. This compares with 57% Mexican-American for Title VII Pooled, 43% for Title VII With Comparison, and 64% for Non-Title VII in the Non-Follow-On Sample. About 44% of the Follow-On Title VII second-graders are of Puerto Rican extraction, and all of these are in the Title VII Without Comparison group. There are no Non-Title VII Follow-On students for this Hispanic subgroup. This contrasts with the Non-Follow-On second-grade group, where students of Puerto Rican background comprise 32% of the Title VII With Comparison, 28% of the Title VII Without Comparison, and 27% of the Non-Title VII Sample.

A similar situation exists for the third grade, where 27% of the Title VII Follow-On Sample are Mexican-American, with 57% of the Title VII With Comparison group being of this background. The Non-Title VII Follow-On Sample is 100% Mexican-American. In the Non-Follow-On group, Mexican-Americans comprise 66% of the Title VII third-graders, 83% of the Title VII With Comparison, 28% of the Title VII Without Comparison, and 81% of the Non-Title VII group. For the Follow-On third-grade sample, 53% of the Title VII group are of Puerto Rican extraction. Only 1.6% of the Title VII With Comparison are of this Hispanic subgroup, while 85% of the Title VII Without Comparison were Puerto Rican. In the Non-Follow-On group, about 25% of the

Title VII and 13% of the Non-Title VII Samples are of Puerto Rican descent. The Title VII and Non-Title VII students are more similar with respect to Hispanic subgroup membership in the Non-Follow-On groups than in the Follow-On groups.

It appears that the Follow-On sample is not very similar to the Non-Follow-On Sample with respect to percentages of students in each of two major Hispanic subgroups--Mexican-American and Puerto Rican. The ethnic differences correspond directly to the geographic differences noted in the preceding section.

Distribution of bases for presence in Title VII Program. Table II-A-3-5a in Appendix II-A3 shows the numbers and percentages of students according to the basis for their presence in a Title VII Bilingual Education Program classroom. Fewer Follow-On second- and third-grade Hispanic students were in the Program because of need for English instruction (limited proficiency in English) than was the case with the Non-Follow-On Hispanic students. Only 18% of the Hispanic second-grade students and 24% of the third-grade Hispanic students in the Follow-On Sample were there because of need for English instruction. This compares with 36% of the Hispanic second-graders and 31% of the Hispanic third-graders in the Non-Follow-On Sample. *Thus it would appear that fewer of the students in the Follow-On group than in the Non-Follow-On group were judged by their teachers in the 1975-76 school year to have been in the Title VII Program because of their need for English language instruction.*

Percentage of first year U.S. residences. Table II-A-3-6a Appendix II-A-3 indicates that the 1975-76 school year was the first year in a continental United States school for 3% of the Title VII Hispanic second-graders and for 7% of the Title VII Hispanic third-graders in the Follow-On Sample. The percentages were about the same for the Non-Follow-On second-grade Hispanic students. The third-grade Non-Follow-On students had a somewhat lower percentage of about 3%. As can be noted from the table, there was considerably less missing data for the third-grade Follow-On Sample than for the Non-Follow-On Sample. There were no Hispanic students in the Non-Title VII Follow-On Sample for whom the 1975-76 school year was the first year in a continental United States school. For about 2% of the Hispanic Non-Follow-On Non-Title VII students, the 1975-76 school year was the first year in a continental United States school. Although the number of students are very small, it appears that, in general, the Follow-On and Non-Follow-On Samples are quite similar with respect to percentage of first year U.S. residences.

Prior exposure to bilingual education. Table II-A-3-7a Appendix II-A-3 compares the years in bilingual education for the Follow-On and Non-Follow-On students. Because of the almost complete absence of data for the second-grade Non-Title VII Follow-On students and the greater than half missing responses for the third grade students, the data for the Non-Title VII Follow-On group should be interpreted with extreme caution. For the second-grade Non-Title VII Follow-On group, data were available for only one student out of the 57 and for less than 45% of the third-grade Non-Title VII Follow-On students. One wonders why there is such a massive amount of missing data for the Non-Title VII students. One possible explanation is that the item was initially designed with the Title VII student in mind, and that Non-Title VII teachers may have had difficulty in responding to it since the lowest response category was "one year or less". There was no "none" category. At any rate, the fact that the teachers of 56 out of 57 Non-Title VII second-grade students left the item blank raises serious questions about the validity of the item for Non-Title VII students, especially for the Follow-On second-graders. The doubts remain for the third-graders as well, since more than half of them had missing data on this item.

Title VII was a different case. There were no missing data for the second- and third-grade students. The table shows that 99% of the Title VII Hispanic second-graders in the Follow-On Sample had had two or more years of bilingual education by the end of the second grade (1975-76 school year). In this they were quite similar to the Non-Follow-On Title VII Sample, of which 98% had had two or more years. Ninety-five percent of the Title VII Hispanic third-graders in the Follow-On Sample and about 98% in the Non-Follow-On Sample had had two or more years of bilingual education at the end of their third grade in the 1975-76 school year. Of the Hispanic third-graders in both the Follow-On and the Non-Follow-On Samples, 77% had had three or more years of bilingual education. Thus, the Title VII Follow-On and the Non-Follow-On Samples appear similar with respect to number of years in bilingual education.

Average student age. Table II-A-3-8a in Appendix II-A-3 shows the ages of the students in the Follow-On and Non-Follow-On samples. Within the Follow-On group, the average age of second-grade Title VII Hispanic students was about 2.5 months greater than for Non-Title VII students. Also, within the third-grade Title VII sample, the Title VII With Comparison students were almost three months older than the Title VII students in projects which had no comparison sites. There were no significant differences between the Follow-On and Non-Follow-On samples with respect to age within the second grade and within the third grade.

Average socioeconomic status. The socioeconomic status (SES) of the students in the Follow-On and Non-Follow-On Samples is shown in Table II-A-3-9a in Appendix II-A-3. There are some significant differences among the various subgroups which bear examination and which should be considered in evaluating the comparability of the Follow-On and Non-Follow-On groups. The second-grade Title VII Follow-On students are of significantly higher SES than the Title VII second-graders who were not followed into the 1976-77 school year. This difference holds for the three groups of Title VII students (Title VII Pooled, Title VII With Comparison, Title VII Without Comparison). For the third-grade Follow-On Sample, the Title VII Pooled students are of significantly higher SES than the Non-Title VII, and the Follow-On Title VII Without Comparison students have a lower SES than the comparable Non-Follow-On students. For the third grade, however, the Title VII With Comparison Follow-On and Non-Follow-On groups are not significantly different, nor are the Non-Title VII Follow-On groups significantly different from the Non-Title VII Non-Follow-On students. Within the Follow-On group, the Title VII Hispanic group in both grades is of higher SES than the Non-Title VII group. In general, there appears to be differences between Title VII Follow-On and Non-Follow-On second-graders in terms of student socioeconomic status.

Average school days absent. The number of school days absent between the fall 1975 and spring 1976 test dates was examined, and the results are found in Table II-A-3-10a in Appendix II-A-3. The Non-Title VII second-grade students in the Follow-On Sample were absent fewer days than the Non-Follow-On Sample. Also, the Follow-On Title VII Hispanic students in both the second and the third grades were absent more days than were the Non-Title

VII students. While the differences were statistically significant, they were generally of the magnitude of only three to four days. There were no significant differences in days absent between the third grade Follow-On and Non-Follow-On students; but the Non-Title VII second grade Follow-On And Non-Follow-On groups differed in this respect.

Teacher assessment of English-speaking ability. On the portion of the Student Questionnaire completed by the teacher, he/she was asked to assess whether the student was a monolingual Spanish speaker, a bilingual English/Spanish speaker, or a monolingual English speaker. The results of these responses for the Title VII and Non-Title VII Follow-On and Non-Follow-On Hispanic students are shown in Table II-A-3-11a in Appendix II-A-3. The information presented is for the 1975-76 school year and for the grade the students were in during that school year. It will be recalled that no questionnares could be administered during the 1976-77 school year. The comparisons are therefore between Hispanic Follow-On students and Non-Follow-On students as of the 1975-76 school year. In regard to teacher assessment of English-speaking ability there were significant differences between grade 3 Follow-On and Non-Follow-On on students with more Title VII students being judged Spanish monolingual in the Follow-On than in the Non-Follow-On group.

Student assessment of own English-speaking and understanding ability and Spanish-speaking and understanding ability. Tables II-A-3-12a and II-A-3-13a in Appendix II-A-3 compare the Hispanic Follow-On and Non-Follow-On groups with respect to the student's own assessment of his/her ability to understand and speak English and Spanish. Table II-A-3-12a shows the results for understanding and speaking English, and Table II-A-3-13a shows the results related to understanding and speaking Spanish. The only significant difference between the Follow-On and the Non-Follow-On students was between the third-grade Title VII Without Comparison Follow-On and Non-Follow-On students in regard to proficiency in English. The difference, though statistically significant, was small and not likely to be of educational significance. There were no significant differences between the Follow-On and Non-Follow-On groups in proficiency in Spanish.

However, statistical differences, though small, seem to exist between some of the groups within the Follow-On Sample. There were small but statistically significant differences between the Title VII and Non-Title VII groups in students' assessment of their ability to understand and speak English. This difference was significant in the second-grade but not in the third-grade sample. However, in the third-grade Follow-On group there was a significant difference between those Title VII students With comparison sites and those Without in that the Title VII With Comparisons assessed themselves higher in English understanding and speaking ability. There were no differences between the Hispanic second-graders in Title VII and those in Non-Title VII with respect to their own assessment of their speaking and understanding ability in Spanish. Differences did exist in the third grade between Title VII and Non-Title VII groups.

It should be noted that the scores shown on Tables II-A-3-12a and II-A-3-13a in Appendix II-A-3 had a possible range from 10 to 30. There were two questions for assessing skills in each language--one tapping understanding of the spoken language and the other tapping the ability to speak the language. The response categories for these items were (a) Yes, very well, (b) Yes, more or less, (c) No, I can't. A score of 30 would indicate a "Yes, very well" response to both the speaking and understanding items. A score of 25 would result from a "Yes, very well" to one of the items and a "Yes, more or less" to the other. The average score for Hispanic students both in Title VII (With and Without Comparisons) and in Non-Title VII was generally greater than 25 in both grades 2 and 3 and for both English and Spanish and for both Follow-On and Non-Follow-On samples. In general, the Follow-On and Non-Follow-On groups do not appear different from each other in respect to the students' assessment of their aural/oral language abilities in English and Spanish.

Summary and conclusions. By way of summary, the Follow-On and Non-Follow-On Samples were compared on the following characteristics and were found to be similar or different as noted:

- Geographic distribution: The Follow-On Sample was less balanced across the geographic regions that was the Non-Follow-On Sample.

- Hispanic subgroup: Follow-On and Non-Follow-On groups were not similar with respect to percentages of students in each of the two major Hispanic subgroups in the Study, Mexican-American and Puerto Rican.
- Basis for presence in Title VII classrooms: Fewer of the students in the Follow-On Sample than in the Non-Follow-On Sample were judged by their teachers in the 1975-76 school year to have been in the Title VII classroom because of their need for English instruction.
- Percentage of first school year in the United States: Follow-On and Non-Follow-On Samples were similar with respect to this characteristic.
- Prior exposure to bilingual education: Follow-On and Non-Follow-On Samples appear similar with respect to this characteristic.
- Average student age by grade: There were significant differences between Follow-On and Non-Follow-On Samples with respect to age by grade.
- Average socioeconomic status: Differences were found between the Follow-On and Non-Follow-On Title VII Sample, especially in the second grade, with the Follow-On Sample having a significantly higher SES than the Non-Follow-On Sample.
- Average school days absent: The Follow-On and Non-Follow-On Samples were essentially similar with respect to this characteristic with any differences being limited to 3 or 4 days for the school year.
- Teacher assessment of English- and Spanish-speaking ability: The Follow-On Title VII and Non-Follow-On Samples were different in this report.
- Student's own assessment of English- and Spanish-speaking and understanding ability: The Follow-On and Non-Follow-On Samples were similar with respect to this characteristic.

From the comparisons discussed above, it is evident that the Follow-On and Non-Follow-On Samples differ in several important aspects and it would appear reasonable to consider the data collected in the fall of 1976 as data from a somewhat different subset of Title VII and Non-Title VII students.

Results: Impact of the Title VII Program on Achievement Gains Measured from Fall 1975 to Fall 1976

Results of the impact analyses are presented separately by method of comparison. It must be noted, however, that because the Impact Study could not control any of the factors that can compromise the internal validity of the findings, the results of any existing statistical methodology are open to question. It is even possible that the results of one methodology may appear to favor one group, while the results of another methodology may show no difference from or may even favor another group. Thus, after presenting the results from the analyses of covariance, from the standardized gain scale analyses, and from comparisons with national norms, this section will conclude with an assessment of the convergent evidence across methods. Also discussed will be reasons for discrepancies, if any, among the methods.

Before proceeding to a discussion of the analyses, the reader may wish to examine Tables II-A-3-12a through II-A-3-23a in Appendix II-A-3. These show basic statistics on which the analyses were based--the means and standard deviations for socioeconomic status, number of days at school, and each of the achievement test measures from the fall 1975, spring 1976, and fall 1976 scores. It is because one cannot interpret the differences between groups directly from these tables that the indirect inferential statistical methods were employed.

Analysis of covariance. The results of the analyses of covariance are presented in Tables II-A-3-24a through II-A-3-31a in Appendix II-A-3. These tables display the proportions of variance accounted for in the fall 1976 scores in English Reading (CTBS Reading Total Expanded Standard Score, CTBS Reading Total Expanded Standard Score [Rescored], and CTBS Reading Vocabulary Expanded Standard Score) and in Mathematics (CTBS Mathematics Computation Expanded Standard Score) by the statistical tests implied by Questions 1, 2, and 3 that were discussed on pages II-18 and II-19. Tables II-A-3 through

TABLE II-A-3

CTBS Reading Total Adjusted Fall 1976 Means and Standard Deviations[a] for Non-Title VII and Title VII Hispanic Students in Grades 2 and 3

Grade 2

	Non-Title VII	Title VII		
		Title VII With Comparison	Title VII Without Comparison	Title VII Pooled
Adjusted Mean	323.16[b]	296.52[b]	299.79[b]	298.65[b]
Pooled Adjusted Standard Deviation	40.00	40.00	40.00	40.00
Adjusted Mean Deviation from Overall Mean in Standard Deviation Units	+.41[b]	-.26[b]	-.18[b]	-.21[b]

Grade 3

	Non-Title VII	Title VII		
		Title VII With Comparison	Title VII Without Comparison	Title VII Pooled
Adjusted Mean	323.83	326.82	327.27	326.85
Pooled Adjusted Standard Deviation	36.61	36.61	36.61	36.61
Adjusted Mean Deviation from Overall Mean in Standard Deviation Units	-.06	.03	.04	.03

---

[a] These adjustments were made using a common estimate of regression slopes for the covariates across the different treatment groups. In some cases, as shown in Tables II-A-3-24a through II-A-3-31a in Appendix II-A-3, there are grounds for rejecting this procedure because regression slopes were found to differ significantly between treatment groups.

[b] This estimate is questionable because of heterogeneity of regression.

TABLE II-A-4

CTBS Reading Total (Rescored) Adjusted Fall 1976 Means and Standard Deviations[a] for Non-Title VII and Title VII Hispanic Students in Grades 2 and 3

Grade 2

	Non-Title VII		Title VII	
		Title VII With Comparison	Title VII Without Comparison	Title VII Pooled
Adjusted Mean	324.21[b]	291.08[b]	296.42[b]	294.44[b]
Pooled Adjusted Standard Deviation	41.80	41.80	41.80	41.80
Adjusted Mean Deviation from Overall Mean in Standard Deviation Units	.48[b]	-.31[b]	-.18[b]	-.23[b]

Grade 3

	Non-Title VII		Title VII	
		Title VII With Comparison	Title VII Without Comparison	Title VII Pooled
Adjusted Mean	322.91	322.75	316.13	319.31
Pooled Adjusted Standard Deviation	38.14	38.14	38.14	38.14
Adjusted Mean Deviation from Overall Mean in Standard Deviation Units	.07	.06	-.11	-.03

[a] These adjustments were made using a common estimate of regression slopes for the covariates across the different treatment groups. In some cases, as shown in Tables II-A-3-24a through II-A-3-31a in Appendix II-A-3, there are grounds for rejecting this procedure because regression slopes were found to differ significantly between treatment groups.

[b] This estimate is questionable because of heterogeneity of regression.

TABLE II-A-5

CTBS Reading Vocabulary Adjusted Fall 1976 Means and Standard Deviations[a] for Non-Title VII and Title VII Hispanic Students in Grades 2 and 3

Grade 2

	Non-Title VII		Title VII	
		Title VII With Comparison	Title VII Without Comparison	Title VII Pooled
Adjusted Mean	322.54[b]	303.37[b]	303.47[b]	303.37[b]
Pooled Adjusted Standard Deviation	39.97	39.97	39.97	39.97
Adjusted Mean Deviation from Overall Mean in Standard Deviation Units	.32[b]	-.16[b]	-.15[b]	-.16[b]

Grade 3

	Non-Title VII		Title VII	
		Title VII With Comparison	Title VII Without Comparison	Title VII Pooled
Adjusted Mean	328.71	326.81	322.29	32 .42
Pooled Adjusted Standard Deviation	42.79	42.79	42.79	42.79
Adjusted Mean Deviation from Overall Mean in Standard Deviation Units	.07	.03	-.08	-.03

[a] These adjustments were made using a common estimate of regression slopes for the covariates across the different treatment groups. In some cases, as shown in Tables II-A-3-24a through II-A-3-31a in Appendix II-A-3, there are grounds for rejecting this procedure because regression slopes were found to differ significantly between treatment groups.

[b] This estimate is questionable because of heterogeneity of regression.

TABLE II-A-6

CTBS Mathematics Computation Adjusted Fall 1976 Means and Standard Deviations[a] for Non-Title VII and Title VII Hispanic Students in Grades 2 and 3

Grade 2

	Non-Title VII	Title VII		
		Title VII With Comparison	Title VII Without Comparison	Title VII Pooled
Adjusted Mean	327.89[b]	304.43[b]	318.16[b]	314.04[b]
Pooled Adjusted Standard Deviation	31.37	31.37	31.37	31.37
Adjusted Mean Deviation from Overall Mean in Standard Deviation Units	.32[b]	-.43[b]	.01[b]	-.13[b]

Grade 3

	Non-Title VII	Title VII		
		Title VII With Comparison	Title VII Without Comparison	Title VII Pooled
Adjusted Mean	357.20	361.99	366.00	364.53
Pooled Adjusted Standard Deviation	34.57	34.57	34.57	34.57
Adjusted Mean Deviation from Overall Mean in Standard Deviation Units	-.16	-.02	.10	.06

[a] These adjustments were made using a common estimate of regression slopes for the covariates across the different treatment groups. In some cases, as shown in Tables II-A-3-24a through II-A-3-31a in Appendix II-A-3, there are grounds for rejecting this procedure because regression slopes were found to differ significantly between treatment groups.

[b] This estimate is questionable because of heterogeneity of regression.

II-A-6 (in the text) show adjusted means and standard deviations of the CTBS posttest variables.

When Title VII versus Non-Title VII comparisons were based only on communities in which control classrooms could be found (see the top part of Tables II-A-3-24a through II-A-3-31a, Appendix II-A-3), no problems of heterogeneity of regression were encountered, so tests for all four measures and two grades were possible without resort to transformed scores. The results were consistent across measures but not across grades: for the second-grade cohort, differences at the .01 level of significance were found on all four measures favoring the Non-Title VII treatments; for the third-grade cohort, none of the differences were significant, even at the .10 level of significance.

As stated earlier, these analyses estimate overall Title VII effectiveness given the (untestable) assumption that the relative effects would be the same in communities without comparison classrooms as in communities with comparison classrooms. In cases where statistical tests (subquestions 2.A.i. and 2.A.ii) have shown that there are no differences in Title VII treatment group gains between the two types of communities, this assumption can be weakened and the generalizability of results correspondingly strengthened. The remaining assumption is that if there are no differences in gains in Title VII classrooms between community types, then there are not likely to be differences in gains in Non-Title VII classrooms between community types. Thus, if the Title VII treatments are equally effective in the different community types, all of the Title VII scores from both community types can be pooled for comparison with Non-Title VII treatment groups.

The major result of attempting this comparison (Title VII Pooled gains versus Non-Title VII gains) for the grade 2 cohort (see the middle portions of Tables II-A-3-24a through II-A-3-27a in Appendix II-A-3) was the finding of lack of homogeneity of regression slopes between the two Title VII treatment groups for the three CTBS Reading scores. Inspection of regression coefficients in these analyses showed that Title VII fall 1976 posttest scores were significantly more predictable from Title VII fall 1975 pretest scores in the sites without comparison classrooms than in the sites with comparison classrooms. Because (1) the pretest means were higher at the sites without comparison classrooms and (2) some of the scores were at or below the chance level of performance, the use of the transformed scores described in Appendix II-A-1 was appropriate. Using transformed scores, the pooled comparison was possible for the English Total Reading Score. In this case, the comparison favored the Non-Title VII group ($p<-.01$) for English Reading. For the English Total Reading Score (Rescored) and for the English Reading Vocabulary score, the transform reduced but did not sufficiently remove heterogeneity of regression slopes to allow any comparisons of levels of gains. For the Mathematics Computation score, the two Title VII groups could not be pooled because, although their regression slopes were sufficiently similar, the regression intercept was significantly higher for the Title VII group in communities without comparison classrooms. In this case, the two Title VII groups could be compared separately to the Non-Title VII group. The bottom portion of Table II-A-3-27a in Appendix II-A-3 shows that use of transformed Mathematics Computation scores did resolve heterogeneity of regression among Title VII groups and the Non-Title VII group. Here, for the Title VII with comparison analysis, the results favored the Non-Title VII group ($p<.01$).

For the grade 3 cohort (See Table II-A-3-28a through II-A-3-31a in Appendix II-A-3) all pooled tests involving untransformed scores could be performed and none were significant, even at the .10 level.

The adjusted means included in Tables II-A-3 through II-A-6 (in the text) show the size of the differences found to be statistically significant using the analysis of covariance methodology. The average differences between Title VII and Non-Title VII For the grade 2 cohort amounted to roughly three-fifths of the pooled-within-groups residual standard deviation.

For the grade 3 cohort, the (non-statistically-significant) differences were roughly one-tenth of the standard deviation estimate. The size of the differences for the grade 2 cohort would, if corroborated by other analytical methods, suggest that the differences are educationally significant for the children involved.

The preceding results, using analysis of covariance, were based on the assumption, among other things, that the differences between groups on pretests, SES, and number of school days between fall 1975 and fall 1976 testing were not much larger than would be expected by chance. If large differences in these covariates existed between groups, then ANCOVA might tend to undercorrect for the differences (Campbell and Boruch, 1975) and the group which was "better" at the time of pretest would appear "better" at posttest also. In an effort to improve the interpretation of the results, the staff of the project assessed the possibility of such undercorrection artifacts. Unfortunately for the present analyses, that artifactual situation closely matches much of the data: for the grade 2 cohort, the significant differences favoring the Non-Title VII group all occurred when the Non-Title VII group had large and significant advantages in terms of pretest scores; but for the grade 3 cohort, where pretest score distributions were very similar (see Appendix II-A-3, Tables II-A-3-32a and II-A-3-33a), no significant differences were found. Thus, a possible alternative explanation for the results of the ANCOVA comparisons, especially those favoring Non-Title VII in the grade 2 cohort, is that ANCOVA did not adequately control for pretest differences. Further analyses were then performed.

Standardized residual gain score analyses. The most common method for avoiding the undercorrection artifact is to perform analysis of variance with standardized gain scores. This method assumes that mean standardized differences among groups on the pretest would, if there were no Program impact, be the same at posttest time. If this assumption is tenable, an unbiased estimate of Program impact could be computed.

The results of the standardized residual gain score analyses are presented in Tables II-A-3-34a through II-A-3-39a in Appendix II-A-3. In each table, the correlations of treatments with test scores is shown for the pretest and posttest. Corresponding correlations for the spring 1976 testing are included for comparative purpose. It can be shown that treatment impact on gains is reflected by a change in the correlation from pretest to posttest. Thus, the statistical significance of each result (shown in the right-hand column of each table) is, in effect, a test of differences in mean standardized gains. The results are presented both with and without controlling for variation in SES and number of school days intervening between pretest and posttest. Any differences between these two sets of analyses would indicate that SES or number of intervening school days differences between groups might account for differences in gains. The only differences, and they were minor, were (1) that based on partial correlations, the Program had significantly negative effects in communities with comparisons on English Total Reading Score (Rescored) gains in grade 2, but, based on raw correlations, the differences were not significant; and (2) that, based on raw correlations, the Program had significantly positive effects on Mathematics Computation gains in Grade 3 in pooled analyses, but, based on partial correlations, the gains were not significantly different.

In the comparisons of Title VII and Non-Title VII groups in communities containing comparison classrooms, the only effect approaching statistical significance for the Grade 2 cohort was in the English Total Reading Score (Rescored) (see Table II-A-3-34a in Appendix II-A-3) where greater gains were shown by the Non-Title VII group. For the grade 3 cohort, no differences were statistically significant (see Table II-A-3-35a in Appendix II-A-3).

To assess the appropriateness of pooling the Title VII groups from communities with and without comparison classrooms, these two groups were compared (see Tables II-A-3-36a and II-A-3-37a in Appendix II-A-3). On the Mathematics Computation test, significant differences were found, favoring the sites without comparison classrooms in grade 2 but favoring the sites with comparison classrooms in grade 3. It appeared reasonable to pool only on the English Reading and Vocabulary measures. Comparisons between the Title VII Pooled group and the Non-Title VII group on these measures (see Tables II-A-3-38a and II-A-3-39a in Appendix II-A-3) did not yield significant differences (at the .05 level).

In summary, none of the results of allowable tests using the standardized residual gain score analysis indicated significant positive effects of Title VII relative to Non-Title VII. Of the overall Title VII Pooled/Non-Title VII comparisons only one significantly favored Title VII, the Pooled comparison on Mathematics Computation in the grade 3 cohort. However, this was disallowed because the gains of students in Title VII classrooms without comparisons were substantially larger than those of students in Title VII classrooms with comparisons, and this meant pooling Title VII groups was inappropriate.

Finding that students in Title VII classrooms without comparisons gained more than the other two groups can be more plausibly interpreted, in this case, as an effect of community factors than as an effect of Title VII. Moreover, this effect was rendered statistically insignificant by controlling for SES differences and differences in the pretest-posttest interval.

Comparison with national norms. The percentile ranks corresponding to the mean expanded standard scores on the CTBS tests are given in Tables II-A-7 and II-A-8 for each of the analysis groups. For the grade 2 cohort, the change of test levels from Level C to Level 1 (necessitated by the students' becoming third-graders) meant that observed gains or losses from fall-to-fall may be subject to distortion due to the lack of articulation in expanded standard score scales from different levels of the test. These analyses are further complicated by the fact that in all cases in which Level 1 is indicated as the in-level test in Tables II-A-7 and II-A-8, a small number of students actually took an out-of-level test in English Reading (Level C). This occurred when the teacher considered Level 1 to be too difficult a test for the student. These students have been included by assuming they would have achieved the same CTBS expanded scale score in English Reading had they taken the Level 1 test. No students were administered out-of-level tests in Mathematics.

For the grade 2 cohort, on the English Reading tests there appeared to be a small gain in percentile rank by all three analysis groups between fall 1975 and fall 1976. These gains must be interpreted in terms of the difference in times of testing, however. According to the norms tables presented by the test publisher, for this range of test scores the percentile rank for a particular raw score decreases at a rate of roughly two to three percentile points per month. For example, a raw score of 30 on the Reading Total score for Level 1, Form S, is equivalent to a percentile rank of 35 in October of the third grade but is equivalent to a percentile rank of 28 three months later. Thus, all of the fall-to-fall gains are probably overestimated by about one percentile point because the fall 1976 testing was roughly two weeks later in the school year than the fall 1975 testing.

For the grade 3 cohort, the percentile ranks remained quite constant from one fall to the next, except for a dramatic gain in Mathematics Computation skills among students in those Title VII treatments for which there were no comparison classrooms. These students scored much more poorly than

TABLE II-A-7

Percentile Ranks for Average CTBS Expanded Standard Scores and Average Time of Testing for Non-Title VII and Title VII Hispanic Students--Fall 1975 to Fall 1976 Analyses, Cohort 2

				Non-Title VII		Title VII					
						Sites With Identified Comparisons		Sites Without Identified Comparisons		Total Title VII	
CTBS Score	Form/ Level	Time of Testing of Norm Sample	Time of School Year	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank
Reading Total	S/C	Early Oct.	Fall 75	Late November	28.1	Late November	11.6	Mid-November	16.5	Mid-November	14.7
	S/C	Early April	Spring 76	Early May	34.9	Late April	12.5	Mid-May	23.3	Early May	18.3
	S/1	Early Oct.	Fall 76	Early December	39.0	Mid-December	17.0	Early December	23.1	Early December	20.9
Reading Total Rescored	S/C	Early Oct.	Fall 75	Late November	25.5	Mid-November	10.0	Mid-November	13.9	Mid-November	12.3
	S/C	Early April	Spring 76	Early May	34.9	Late April	11.4	Mid-May	19.9	Early May	16.3
	S/1	Early Oct.	Fall 76	Early December	39.3	Early December	15.7	Early December	21.4	Early December	19.3
Reading Vocabulary	S/C	Early Oct.	Fall 75	Late November	29.5	Mid-November	14.0	Mid-November	18.1	Mid-November	16.5
	S/C	Early April	Spring 76	Early May	34.3	Late April	12.0	Mid-May	21.2	Early May	17.4
	S/1	Early Oct.	Fall 76	Early December	38.8	Early December	19.8	Early December	23.0	Early December	21.8
Math Computation	S/C	Early Oct.	Fall 75	Late November	46.0	Mid-November	22.2	Mid-November	23.6	Mid-November	23.2
	S/C	Early April	Spring 76	Early May	49.9	Late April	31.5	Mid-May	44.7	Early May	40.7
	S/1	Early Oct.	Fall 76	Early December	58.8	Early December	21.0	Late November	36.0	Early December	31.3

TABLE II-A-8

Percentile Ranks for Average CTBS Expanded Standard Scores and Average Time of Testing for Non-Title VII and Title VII Hispanic Students--Fall 1975 to Fall 1976 Analyses, Cohort 3

				Non-Title VII		Title VII					
						Sites With Identified Comparisons		Sites Without Identified Comparisons		Total Title VII	
CTBS Score	Form/ Level	Time of Testing of Norm Sample	Time of School Year	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank
Reading Total	S/1	Early Oct.	Fall 75	Mid-November	16.4	Mid-November	22.4	Early November	10.3	Mid-November	16.6
	T/1	Early April	Spring 76	Early May	18.5	Early May	25.9	Late May	11.6	Mid-May	18.5
	S/1	Early Oct.	Fall 76	Late November	15.7	Late November	22.2	Early December	13.1	Early December	17.7
Reading Total Rescored	S/1	Early Oct.	Fall 75	Mid-November	16.4	Mid-November	22.4	Mid-November	7.7	Mid-November	13.2
	T/1	Early April	Spring 76	Early May	18.5	Early May	25.9	Late May	9.5	Mid-May	16.3
	S/1	Early Oct.	Fall 76	Late November	15.7	Late November	22.2	Early December	9.6	Early December	14.9
Reading Vocabulary	S/1	Early Oct.	Fall 75	Mid-November	19.1	Mid-November	23.0	Mid-November	10.5	Mid-November	14.9
	T/1	Early April	Spring 76	Early May	20.2	Early May	25.5	Late May	11.6	Mid-May	17.4
	S/1	Early Oct.	Fall 76	Late November	18.0	Late November	22.3	Early December	12.2	Early December	16.6
Math Computation	S/1	Early Oct.	Fall 75	Mid-November	35.4	Mid-November	42.6	Mid-November	19.5	Mid-November	27.3
	S/1	Early April	Spring 76	Early May	43.2	Early May	56.1	Late May	40.5	Mid-May	46.3
	S/1	Early Oct.	Fall 76	Late November	37.8	Late November	46.1	Late November	38.3	Late November	40.9

students in other groups at the time of pretest (averaging barely above the chance level of performance) but had achieved rough parity in achievement by the time of posttest.

Comparison of the percentile ranks presented in Tables II-A-7 and II-A-8 with those presented on pages VI-72 and VI-73 of Volume I shows that the subsample included in fall 1976 posttest data analyses are not typical of the sample included in spring 1976 posttest data analyses. This was especially true of the Non-Title VII comparison classrooms, where for the grade 2 cohort the English Total Reading score and Mathematics Computation percentile ranks in fall 1975 were 14 and 30 for the larger sample and 28 and 46 for the subsample, and for the grade 3 cohort these scores were 22 and 30 for the larger sample and 16 and 35 for the subsample. Thus, any attempts to relate the results of the fall 1976 data collection to the results of the fall-to-spring evaluation are subject to many alternative interpretations.

Since very few Non-Title VII students included in the fall 1976 data collection took the Prueba de Lectura (Spanish Reading) or the Prueba de Comprension Auditiva Ingles (ESL), it was not possible to compare Title VII and Non-Title VII groups on these outcomes. It was possible, however, to compare the gains of students in Title VII classrooms with comparisons and in Title VII classrooms without comparisons. These analyses, for the standardized residual gain analysis (see Tables II-A-3-36a and II-A-3-37a), show that on the ESL test the gains demonstrated by the Title VII With Comparison significantly surpassed those for the Title VII Without Comparison group in grade 2. No statistically significant differences were found for grade 3. These analyses were based upon even smaller numbers of students that were present in the analyses of the CTBS outcomes. Nevertheless, they are worthy of note.

Summary. By use of three different analytic methodologies, project staff authors attempted to reach conclusions regarding Program impact based on true regularities in the data rather than on methodological artifacts. To the extent that the results of different approaches are the same and to the extent that the differences of results from different approaches are explainable as an artifact of one of the approaches, solid conclusions can be stated.

The results can, it turns out, be summarized succinctly. For both the grade 2 cohort and the grade 3 cohort, the fall-to-fall achievement gains in English Reading and in Mathematics Computation in Title VII projects were neither significantly nor substantially different from what would have been expected without Title VII treatment, with one possible exception: the grade 3 cohort of Title VII children in communities for which no comparison classrooms were available (i.e., in the urban Northeast region) showed substantial gains in Mathematics Computation skills. In light of these trends across methods, the significant differences favoring Non-Title VII in some of the grade 2 analyses of covariance were more than likely due to that method's tendency to undercorrect pre-existing group differences in some situations.

A second finding is that the English Reading percentile rank of the average Title VII Hispanic student in grades 2 and 3 was still considerably below grade level in fall 1976 (approximately 20th percentile rank). There were, however, what may be regional differences in level of performance. The status of our sample of Title VII second- and third-graders in Mathematics Computation in fall 1976 was higher than it was for English Reading--the 30th percentile rank for second-graders and the 40th percentile rank for third-graders. There were, however, notable regional differences in percentile ranks.

A third apparent trend that occurred for grade 2 was that for Title VII students whose level of English skills was so low that their teachers elected to give them the ESL test, the gains of those enrolled in Title VII classrooms in communities with comparison schools (predominantly located in the Southwest) surpassed those of the Title VII classrooms without comparison schools.

The conclusions reached here are, in large part, similar to those reached in Volume I, based on fall-to-spring gains, for Hispanic students. The most important differences appear to be due more to restriction of the sample and possibly to revisions in the analytical methods than to reversals of effects over the summer. The most important effect that might be due to the period between spring 1976 and fall 1976 testing concerned Mathematics Computation. Fall-to-spring gains in Mathematics Computation in Title VII sites without comparison classrooms were substantial, but some of the gain appeared to be lost before the testing during the following fall. In the case of the grade 2 cohort, the loss was nearly sufficient to reverse the results to significantly favor the Non-Title VII group, but, in the grade 3 cohort, the significant positive impact of Title VII treatment remained. Finally, the significant negative impact of Title VII on English Reading scores in the grade 3 cohort reported for the fall-to-spring analyses in Volume I was not found in the fall-to-fall analyses. (Title VII impact was not significantly nor substantially different from Non-Title VII). However, for the grade 2 cohort the significant negative impacts of Title VII remained.

B. Further Examination of Fall 1975 to Spring 1976 Data

Context and Purpose

Following the data collection during the 1975-76 school year, two volumes were prepared which presented analyses and findings related to data collected during that school year. Volume I contained the basic study design and interim findings. Volume II contained detailed project descriptions of the Title VII projects participating in the Impact Study. Because of the importance and complexity of this Study and because of the highly political nature of the bilingual education movement and the critical role that the federal Title VII Program has played, the Impact Study volumes were extensively reviewed by individuals both within and outside the Office of Education. Many of the reviewers, who were directly involved with the bilingual education movement, critiqued the Study from a viewpoint which extended beyond the Study's mandate and dealt with broad issues of bilingual education. (The Impact Study was designed to evaluate the overall impact of the federal ESEA Title VII Bilingual Program in terms of its success in meeting the objectives of the federal legislation related to student performance.)

Following the critiques of Volume I, additional time and funds were allocated to the project by the Office of Education to address further some of the issues presented in the critiques as well as those suggested by AIR project staff. This section of Volume III contains the analyses performed as part of this extended effort. In addition to addressing these design-

and analytic-oriented issues, it presents clarification of Volume I findings related to (1) reasons for students' presence in the Title VII classrooms, (2) goals and nature of the projects studied, and (3) reliability and validity of the various teacher judgments which were obtained.

Overview of Issues and Analysis Strategies

Most of the issues and strategies discussed in Section II-A are relevant to the further examination of the Impact Study's fall 1975 and spring 1976 data. The discussion of analysis variables, use of analysis of covariance, standardized gain score analysis and the methodological issues related to the processes by which students become members of a particular analysis group apply equally well to these analyses and to the analyses of the fall 1976 data. Similarly, the procedures and design of the fall-to-fall analyses that take into account Title VII With Comparison, Title VII Without Comparison, and Non-Title VII groups are also relevant to the fall-to-spring analyses discussed here.

Seven separable issues that might affect the interpretation of Program impact comparisons are examined:

- Attrition and missing data due to absence or to the omission of particular tests for different children was investigated. Impact analyses were restricted to children with both pretest and posttest scores to minimize the bias that might occur from attrition; however, the possibility of some bias remains, and the range of effects this could have on test results was estimated.

- Time of testing differences were examined to determine their possible effects on results.

- Effects of differential guessing rates on the impact analyses were estimated.

- Possible ceiling effects were estimated.

- Possible sensitivity of ESL and CTBS Reading tests to gains was investigated.

- Possible effects of mixing in-level and out-of-level tests in the impact analyses were estimated.

- The possibility that different numbers of boys and girls in different treatments might have distorted the impact analyses was assessed.

In addition to the seven major issues just noted, relative to the analyses discussed in Volume I the analyses for this volume also took a larger number of group difference measures into account in the impact analyses that were implemented. Pretest and student socioeconomic status were the only covariates in the Volume I analyses. In the analyses implemented for this part of Volume III, however, four additional covariates were included--three of these were indices reflecting language use and one was the approximate number of school days intervening between the pretest in fall 1975 and the posttest in fall 1976. The following section contains a description of the procedures and rationale involved in developing the language use covariates. No discussion of number of school days has been included because the methods described in Section II-A (with respect to the approximate number of school days between the fall 1975 test and fall 1976 test) apply to the measure developed here--except, of course, that the interval computed was that between the fall 1975 test and the spring 1976 test. The issues related to impact evaluation as well as the findings of such analyses are contained in later sections, along with the impact analyses themselves.

Language Use Indices

Because no suitable group-administered language-dominance assessment instruments were available during the design and data collection phases of the Impact Study, the study could not obtain a test score that would permit a given student to be categorized in terms of his/her "best language for instruction." Nevertheless, because the Title VII and Non-Title VII student groups compared may have differed greatly with respect to use of English and/or Spanish and because such group differences may have somehow "biased" the analyses of Program impact relying on Title VII/Non-Title VII comparisons, project staff implemented a series of analyses that explored whether or not a reliable and valid index of language use could be developed from the data at hand. Such an index or indices, then, could be used as covariates in all subsequent comparative analyses of Program impact and in the analyses relating instructional processes and teacher characteristics to gains in outcomes. The remainder of this section describes the rationale and the procedures used, as well as the results of these index development analyses.

The issues involved in defining and measuring the concepts of "limited English-speaking ability" (LESA) and "best or most appropriate language for instructional purposes" are extremely complex and have been beyond the scope of the Impact Study contract. Thus, it needs to be emphasized that the indices we proposed to develop were not thought of as direct measures of these constructs. Rather, we merely hoped to develop a measure or a series of measures that could be used to rank order, in a meaningful way, the students participating in this study in terms of their language usage.

The first step in these analyses was to identify a series of individual items or multi-item scales present in the Impact Study data base that, on a priori grounds, appeared to measure use of English and/or Spanish. Because such items/scales were judgments, it was desirable that they reflect as many different kinds of judgments as possible. Table II-B-1 shows the items/scales identified. An examination of the content of these items shows that each asks for an assessment of speaking and understanding, rather than reading and writing, of Spanish or English. Second, the coding scheme shown for the items in which a smiling, frowning, neutral or blank face was marked by the student reflected the fact that students were instructed to mark the blank face if a given item did not apply to them (e.g., speaking English at home). Thus, we assumed that if an opinion toward the use of a language was inappropriate, it was because the student did not speak that language. Lastly, the language in which the student-completed questionnaire was taken (the first item listed in Table II-B-1) seemed appropriate here because it reflected aural comprehension rather than literacy, since all such questionnaires were administered orally.

After identifying and coding the variables shown in Table II-B-1, a matrix of pooled within-groups inter-item correlations was computed. The "group" variable here was Title VII (pooled)/Non-Title VII group membership. This was done so that index development would not be influenced by between-group variation in item responses. This procedure utilized the data only for every other student in the Impact Study data base so that any resulting indices could be cross-validated on data not involved in index development. Correlations were based only on students from all grades with complete data on all eleven items/scales entering the analysis.

The pooled within-groups inter-item correlation matrix for the calibration sample (i.e., odd-numbered students) was then subjected to a principal components analysis. Table II-B-2 shows the loadings for the first two unrotated principal components for the calibration sample (odd-numbered students, N = 3588) and for similar analyses based on the hold-out or validation sample (even-numbered students, N = 3645) that were implemented later.

Inspection of the pattern of loadings derived in either analysis and of the manner in which the items/scales were coded suggested that Principal Component or Factor I could be named "Preference for English versus Spanish" and that Principal Component or Factor II could be labeled "Use of Both English and Spanish." Factor scores indices were then computed for all calibration sample students by first converting each of the eleven items to a standard score where the mean and standard deviation used was that computed for all calibration sample students with data for a given item (i.e., these calculations were not restricted to students with complete data on all eleven items). Factor Score I, Preference for English versus Spanish, was computed by summing the standard scores for

- Language used to complete the Student Questionnaire (E)
- The language I speak best is (E)
- I like to speak Spanish (E)
- I like to speak English (E)

TABLE II-B-1

Items and Scales Identified in Developing Indices of English and/or Spanish Use

Item (from fall 1975)	Source	Alternatives (and Coding)*
Language used to complete the Student Questionnaire	Student-Completed Student Questionnaire	English (2) Spanish (1)
The language I speak the best is	Student-Completed Student Questionnaire	English (3) Spanish and English about the same (2) Spanish (1)
I like to speak Spanish	Student-Completed Student Questionnaire	A lot (1) It's O.K. (1) Not much (1) I don't like it at all (1) I don't speak Spanish (2)
I like to speak English	Student-Completed Student Questionnaire	A lot (2) It's O.K. (2) Not much (2) I don't like it at all (2) I don't speak English (1)
At school, when I speak Spanish	Student-Completed Student Questionnaire	Blank face (1) Smiling face (2) Frowning face (2) Neutral face (2)
At school, when I speak English	Student-Completed Student Questionnaire	Blank face (1) Smiling face (2) Frowning face (2) Neutral face (2)
At home, when I speak Spanish with my family, I feel	Student-Completed Student Questionnaire	Blank face (1) Smiling face (2) Frowning face (2) Neutral face (2)
At home, when I speak English with my family, I feel	Student-Completed Student Questionnaire	Blank face (1) Smiling face (2) Frowning face (2) Neutral face (2)

TABLE II-B-1 (continued)

Item (from fall 1975)	Source	Alternatives (and Coding)*
Students' Perceived Proficiency in English (2 item scale):	Student-Completed Student Questionnaire	
Can you understand English?		Yes, very well (3) Yes, more or less (2) No, I can't (1)
Can you speak English?		Yes, very well (3) Yes, more or less (2) No, I can't (1)
Students' Perceived Proficiency in Spanish (2 item scale):	Student-Completed Student Questionnaire	
Can you understand Spanish ?		Yes, very well (3) Yes, more or less (2) No, I can't (1)
Can you speak Spanish ?		Yes, very well (3) Yes, more or less (2) No, I can't (1)
The child's dominant language is	Teacher-Completed Student Questionnaire	English (2) Spanish (1)

---

*The coding of items/scales shown here does not necessarily correspond with that used in other portions of the report.

TABLE II-B-2

Loadings for Eleven Items/Scales on Two Unrotated Principal Components, Calibration, and Validation Samples

Item/Scale	Direction of Coding, English (E) or Spanish (S)	Principal Component Loading			
		I		II	
		Calibration Sample	Validation Sample	Calibration Sample	Validation Sample
Language Used to Complete the Student Questionnaire	E	.60	.62	.21	.25
The Language I Speak Best Is	E	.79	.79	-.03	.00
I Like to Speak Spanish	E	.55	.50	-.39	-.54
I Like to Speak English	E	.25	.23	.50	.63
At School, When I Speak Spanish	S	.00	-.05	.44	.24
At School, When I Speak English	E	-.05	-.06	.43	.16
At Home, When I Speak Spanish with My Family, I Feel	S	-.02	-.05	-.40	-.34
At Home, When I Speak English with My Family, I Feel	E	-.11	-.21	.40	.10
Student's Personal Proficiency in English	E	.57	.57	.45	.51
Student's Personal Proficiency in Spanish	S	-.70	-.68	.39	.45
The Child's Dominant Language	E	.76	.75	.07	-.01
Proportion of Variance Accounted for		24.80	24.60	13.70	13.20

- Student's Perceived Proficiency in English (E)
- The child's dominant language is (E)

subtracting the standard score for

- Student's Perceived Proficiency in Spanish (S)

and dividing the result by the square root of the number of nonblank item standard scores involved in the computation. Dividing the result by the square root of the number of items added (or subtracted) was done to equate the variance of factor scores based upon sums of differing numbers of items.

Factor Score II, Use of Both English and Spanish, was computed by summing the standard scores for

- I like to speak English (E)
- At school, when I speak Spanish (S)
- At school, when I speak English (E)
- At home, when I speak English with my family I feel (E)
- Student's Perceived Proficiency in English (E)
- Student's Perceived Proficiency in Spanish (S)

and subtracting the standard scores for

- I like to speak Spanish (E)
- At home, when I speak Spanish with my family, I feel (S)

The result of these computations was also divided by the square root of the number of items present.

The procedure of adding and subtracting standard scores to create factor scores in effect weighted each item by 1.0 or -1.0. This was done to simplify the computation of these scores and seemed justifiable because the factor loadings for each of the items used to construct a given factor score were, in most cases, relatively similar in magnitude.

The validity of Factor Scores I and II was evaluated by examining their relationship with the teacher's assessment of the student's language dominance, a single item on the teacher-completed portion of the Student Questionnaire. Therefore, factor scores were computed for all calibration sample students and associated with the teacher's assessment of the student's language dominance. Table II-B-3 in the text, and Tables II-B-1a through II-B-5a in Appendix II-B show that overall and at each grade level there were fairly large mean group differences on Factor Score I for students in the calibration sample. Students designated by their teachers as "monolingual Spanish speakers" got low scores on Factor Score I, students designated as "monolingual English speakers" obtained high scores on Factor Score I, and students identified as "bilingual English/Spanish speakers" scored between the two monolingual groups. The same pattern of differences among means on Factor Score I occurred at every grade level. These results suggested that Factor Score I could be viewed as a language use index and that its label "Preference for English versus Spanish" was appropriate.

Mean differences for the calibration sample (see Table II-B-3, and in Appendix II-B, Tables II-B-1a through II-B-5a) on Factor Score II were smaller than for Factor Score I. Nevertheless, at every grade level, the means for students designated as "bilingual English/Spanish speakers" was greater than that for either monolingual group. These results, when considered along with those for Factor Score I, suggested that Factor Score II could be viewed as providing a relative measure of a construct called Use of Both English and Spanish.

These conclusions were, of course, dependent upon whether or not the criterion variable used, a single item on which the teacher indicated the student's spoken-language skills, was a credible criterion. Common sense does suggest that teachers should be able to identify accurately whether or not a given student is a monolingual Spanish speaker or a monolingual English speaker. This seems especially reasonable for the Title VII and Non-Title VII teachers sampled by the Impact Study because (1) many teachers claimed to be Spanish/English bilingual or, at least, to have spoken Spanish sometime during their lifetime; (2) the large numbers of Hispanic students in both Title VII and Non-Title VII classrooms or schools would mean that most teachers would be exposed to Spanish-speaking children and should, at the very least, be able to identify Spanish when they heard it; and (3) teachers had sufficient time to observe their students in a number of different academic and social situations since the teacher-completed student questionnaire was administered two or more months after the beginning of school in fall 1975.

For these reasons, it seems likely that the designations "monolingual English speaker" and "monolingual Spanish speaker" were accurate. This being the case, what can be said about the accuracy of the designation "bilingual English/Spanish speaker"? The most logical answer is that a student designated as a "bilingual English/Spanish speaker" was not a Spanish or English monolingual speaker. Whether or not the students given this designation were truly bilingual cannot be inferred. However, the facts that the factor score indices were created from meaningful combinations of items concerning language use and that expected group differences on the factors were observed (see Table II-B-3 and Tables II-B-1a through II-B-5a in Appendix II-B) do tend to validate both the factor score indices and the credibility of the item used as the criterion variable in these analyses.

To ascertain if these results were stable and not due to capitalizing on chance relationships among items in the calibration sample data, similar computations were performed on validation sample students. As shown in Table II-B-2, the principal component solutions for the calibration and validation samples were very similar. Table II-B-3 and Tables II-B-1a through II-B-5a in Appendix II-B show the same pattern of results for calibration and verification sample students even though the factor scores for validation sample students were computed using the scaling rules and the means and standard deviations derived in analyses of calibration sample data.

An estimate of the internal consistency reliability of each factor score index was computed by means of a modified coefficient alpha. The

TABLE II-B-3

Calibration Sample and Validation Sample Means and Standard Deviation for Factor Score 1 and Factor Score 2 by Teacher Assessment of Student Language Dominance--All Students

Teacher Assessment of Student Language Dominance	Factor Score 1		Factor Score 2	
	Calibration Sample	Validation Sample	Calibration Sample	Validation Sample
Monolingual Spanish Speaker				
Mean	-1.93	-1.95	-0.14	-0.23
Standard Deviation	1.17	1.21	1.20	1.22
N	564	567	518	515
Bilingual English/Spanish Speaker				
Mean	-0.31	-0.29	0.26	0.27
Standard Deviation	1.08	1.04	1.16	1.07
N	2727	2721	2555	2561
Monolingual English Speaker				
Mean	1.77	1.82	-0.60	-0.58
Standard Deviation	1.00	0.94	1.24	1.23
N	1110	1102	1023	1025
F	2520.71	2788.30	197.24	218.43
n^2	0.53	0.56	0.09	0.10

modification involved correcting the variance of the factor score by an estimate of the average number of items added (or subtracted) to yield the factor score (because a factor score sum for each student was divided by the square root of the number of nonblank items summed to equate the variances of factor scores based upon different numbers of items). The alphas computed from verification sample data were .97 for both Factor Scores I and II.

These results provide evidence that the factor score indices, Preference for English versus Spanish and Use of Both English and Spanish, can be considered valid and reliable measures of their respective constructs. Factor scores were then computed for each student in the Impact Study data base who had at least one of the items entering an index by computing overall means and standard deviations, by computing standard scores, and by summing (or subtracting) item standard scores in the manner described previously.

Since a given factor score could be computed for a student if at least one item contributing to the score was present, the amount of missing data was minimal (11% and 17% for Factor Scores I and II, respectively). Nevertheless, it was desirable to include in analyses all students with pretest and posttest scores and to avoid having to delete students because of missing data on Factor Scores I and II. Thus, missing data was replaced for students who were present during fall 1975 and spring 1976 with the mean score obtained by all students who had data, who were of the same ethnic group (Hispanic, white non-Hispanic, black, and other), who were also present during both fall 1975 and spring 1976, and who were members of the same treatment group (Title VII With Comparison, Title VII Without Comparisons, and Non-Title VII). Because Hispanic students represent the target population of this particular study, grade level was also taken into account in any missing data replacement for such students.

Lastly, because Factor Scores I and II were, by design, not correlated with each other, it was desirable to create a third factor score variable to be used as a covariate along with Factor Score I (Preference for English versus Spanish) and Factor Score II (Use of Both English and Spanish) in later impact analyses. A product variable was generated which, when used along with Factor Scores I and II, would permit statistical adjustments for both factor constructs as well as their interaction. These three variables, then, would permit Title VII/Non-Title VII comparisons and the process analyses to be adjusted for systematic student differences with respect to

- High Preference for English versus Spanish and High Use of Both English and Spanish
- High Preference for English versus Spanish and Low Use of Both English and Spanish
- Low Preference for English versus Spanish and High Use of Both English and Spanish
- Low Preference for English versus Spanish and Low Use of Both English and Spanish

Issues Related to Program Impact Assessment

Attrition and missing data analyses. The impossibility of guaranteeing a 100% test-completion rate poses difficult problems for pretest-posttest evaluation in the schools, because the effect of a program on test scores can only be assessed on a possibly biased subsample of those who participated in the program. It is widely accepted that children whose scores are present for only a single test achieve lower on that test than do children with both pretest and posttest scores. It may even be that the most significant impact of a program is on reduction of absences, thus leading to differential response rates for program and comparison groups. If there is substantial difference in response rates between groups and also a significant variation in mean pretest scores between those with and without posttest scores, then interpretation of the results of impact assessments must be correspondingly cautious.

In an attempt to shed light on the processes that lead to lower response rates, analyses were carried out in two steps: the first was to determine the effects of attrition due to absence of a student from the testing situation, and the second was to determine the effects of omission of tests, or subtests, for students who were present for testing. In order to discriminate between these two causes of missing data, an indicator of student presence that was not directly related to each test score was used--namely, whether or not a correct answer was given on at least one subtest in the total battery. The two processes, attrition due to absence and omission of tests, clearly involve different causes, and separating their effects may have important implications for the interpretation of evaluation results, as well as for future evaluation design.

One possible tactic to deal with attrition is to ignore it and use all test scores in analyses. Trisman et al. (1975) used this approach in their evaluation of compensatory Reading programs. This approach appears to be of dubious validity because students missing spring scores are likely to be different from students missing fall scores. To test this possibility in the Impact Study data base, missing data analyses were carried out separately for those missing fall or spring tests.

The first critical question to answer was whether or not there were significant relationships between treatment group membership and rates of attrition due to absence. The results are shown in Table II-B-4. There were significant relationships in all cases except in the fourth grade, where the same proportion of students missed the spring testing in all three treatment groups. The form of the significant relationships was that the lowest attrition due to absences in the spring was in the Title VII (With Comparison) treatment group. In grades 2, 5, and 6 the attrition in the Non-Title VII group was highest. The greatest accretion presence of tests at the spring only, was in the Title VII (Without Comparison) group. The finding that treatment group relationships are different for attrition and accretion casts further doubt on any analyses that require the assumption that those students added in the spring in some sense make up for those lost after fall testing.

Given the presence of statistically significant relationships between treatment group membership and rates of attrition (i.e., that Title VII With Comparison classrooms retained students with greater frequency than did Non-Title VII Comparison classrooms), it was necessary to examine

Table II-B-4

Relationships Between Treatment Group and Attrition Rates: Number Hispanic Students Present for Tests in Fall and Spring

	GRADE														
	2			3			4			5			6		
Group	Both	Fall Only	Spring Only	Both	Fall Only	Spring Only	Both	Fall Only	Spring Only	Both	Fall Only	Spring Only	Both	Fall Only	Spring Only
Title VII With Comparison	333	28	40	660	78	61	502	76	58	155	15	16	54	3	5
Title VII Without Comparison	480	97	102	371	71	78	523	72	81	672	73	123	346	93	119
Non-Title VII	321	74	52	520	71	59	551	64	46	154	31	10	76	23	9
χ^2 (Both vs. Fall Only)	$= 20.7, p < .001$			$= 18.3, p < .001$			$= 2.2$, ns			$= 8.3, p < .05$			$= 8.8, p < .05$		
χ^2 (Both vs. Spring Only)	$= 8.6, p < .05$			$= 23.0, p < .001$			$= 10.4, p < .01$			$= 13.0, p < .01$			$= 16.3, p < .001$		

mean differences in scores between students with one test and those with two. Of course, if those with a single score would have shown the same gains as those with both scores present, then no correction for attrition would be necessary.

There is no way, short of tracking down those with fall pretests only and administering special posttests, of knowing what spring posttest scores they would have obtained. Therefore, we can only attempt to estimate what the size of distortion of results could have been, due to attrition effects, assuming some reasonable limits. The method selected for this estimate was, first, to "correct" the fall and spring mean test scores to what they would have been had attrition and accretion not varied between treatment groups; second, to calculate mean group gains based on these "corrected" data; and, third, to present the differences between "corrected" gains and actual gains as possible corrections to apply to Program impact analysis results. This is, of course, a very rough estimate, but it can be used to decide whether possible attrition effects are generally much smaller than or about the same size or much larger than the effects identified as significant in impact analyses.

To estimate what scores might have been obtained under conditions of equal attrition across treatment groups, it was necessary to take into account the possibility that in some cases attrition is more highly correlated with test scores than in other cases (e.g., attrition due to bad weather versus attrition due to reassignment to a different classroom). Thus, for attrition to be homogeneous we must have both a homogeneous rate of attrition and a homogeneous relation of attrition to test scores. The "corrected" mean scores were therefore computed from the constraints that

- The overall mean for each treatment group, including those with both tests and those with fall (spring) only, be the same as in the data
- The attrition rate in each treatment group be the same
- The difference in means between children who took one or both tests be the same in all treatment groups

These constraints determined the means for hypothetical groups who would have had both tests available if attrition had been homogeneous. Correction scores were then calculated by subtracting the actual means for those who had both tests available (i.e., those included in the Program impact analyses) from the estimated means. An example is shown below, for fall English Total Reading expanded scale scores for second-graders. In this example,

	ACTUAL DATA				EQUAL ATTRITION ESTIMATES				CORRECTIONS FOR FALL SCORES
	Both Tests		Fall Only		Both Tests		Fall Only		
	mean	%	mean	%	mean	%	mean	%	
Title VII With Comparison	246.2	94	230.9	6	246.9	86	235.3	14	246.9 - 246.2 = .7
Title VII Without Comparison	246.0	84	233.4	16	245.6	86	234.0	14	245.6 - 246.0 = -.4
Non- Title VII	250.3	83	240.6	17	250.3	86	238.7	14	250.3 - 250.3 = .0
Total	247.4	86	235.8	14	247.4	86	235.8	14	

the result is that, for instance, interpretations of the comparison of fall test scores between the Title VII (With Comparision) and Non-Title VII treatments based on the data for those actually having both pretest and posttest scores should be made with the knowledge that had attrition been homogeneous the Title VII group might have had a mean score .7 units higher.

The resulting correction estimates for gains are shown in Table II-B-5. They were obtained by subtracting the correction for fall pretest scores from the correction for spring posttest scores. The estimated corrections are generally small. In fact the only Title VII/Non-Title VII comparisons for which a differential correction of more than 5 expanded standard score points is indicated are for Mathematics scores in the fifth grade and for the Reading Total (and Reading Total [Rescored]) scores in the sixth grade. Both of these corrections, if implemented, would tend to reduce any Title VII positive effects. It should be noted that the estimated corrections are probably overestimates of actual corrections needed to compensate for differential attrition effects because many students who were high (or low) on one test but were missing the other test would probably have scored relatively just as high (or low) on the other test, thus requiring no correction to gain scores. The size of the corrections shown in Table II-B-5 should be viewed in the context that differences of about 10 points are found to be statistically significant in the impact analyses.

TABLE II-B-5

Estimated Corrections to Expanded Standard Score Gains in Different Treatment Groups That Would Result if Attrition Had Been the Same Due to Absences in All Treatments

Test	Group	Grade				
		2	3	4	5	6
Reading Total	Title VII With Comparison	.6	.6	-1.7	0	-5.3
	Title VII Without Comparison	-.5	-3.6	.5	-.2	.6
	Non-Title VII	0	2.0	.7	4.2	3.8
Reading Total Rescored	Title VII With Comparison	2.3	-.1	-1.8	2.7	-5.4
	Title VII Without Comparison	-.6	-2.3	.3	-.6	.8
	Non-Title VII	-.4	2.0	1.0	4.2	3.9
Reading Vocabulary	Title VII With Comparison	2.0	.4	-2.0	.1	-1.2
	Title VII Without Comparison	-.4	-2.1	.8	0	.5
	Non-Title VII	-1.0	1.2	.6	3.0	3.6
Mathematics Computation	Title VII With Comparison	.4	.4	-.5	-1.8	.1
	Title VII Without Comparison	0	-1.5	-.2	-.5	-1.3
	Non-Title VII	-.1	.6	.5	5.8	1.6
Mathematics Total	Title VII With Comparison	.2	.4	-.4	-2.7	0
	Title VII Without Comparison	-.9	-2.4	-.7	-1.2	-1.4
	Non-Title VII	-.6	1.2	.9	6.6	3.8

Next, we considered analogous questions concerning omission of tests for students who appear to have been present for testing. The first question was whether there was differential omission of tests across treatment groups. The results, for the total Reading battery and total Mathematics battery, are shown in Table II-B-6. Except for the Reading test in the second grade, there was no significant variation in omission of spring posttests among treatment groups. Omissions of tests in the fall, on the other hand, were generally related to treatment group: omissions of Reading tests were more common in Title VII classrooms and omissions of Mathematics tests were more common in different groups at different grades (Title VII Without Comparison in grade 3, Non-Title VII in grade 4, and Title VII With Comparison in grade 5). To counteract this effect the rescoring of total Reading scores was undertaken. Because of this finding, it was necessary to compute correction estimates for the test omission effects in the same manner as for attrition due to absence effects. The computed correction estimates are shown in Table II-B-7. The only substantial differential corrections were for Mathematics Computation scores for sixth-graders (the result of missing spring tests for one or two students who achieved very high scores in the fall) and for Mathematics Total scores for fifth- and sixth-graders.

In summary, although there were some significant differences across treatment groups in attrition and test omission effects, their effects on the Program impact analyses were generally not substantial. In the few cases where they might be substantial, employing the estimated corrections would have the effect of making Title VII gains appear smaller. Thus, differential attrition and test omissions could not have been the cause of any lack of finding significant benefits from Title VII treatments in terms of gains on CTBS scales. In particular, the findings reported in Volume I, that positive effects on Reading scores occurred mainly in fourth grade and that differential attrition occurred at all grades except the fourth grade, appear to be coincidental. Finally, if avoidance of student attrition can be considered a positive Program impact, then in communities with comparison schools, Title VII was having a positive impact by significantly reducing fall to spring attrition in grades 2, 3, 5, and 6.

TABLE II-B-6

Interactions Between Treatment Groups and Omissions of Tests, for Students Present at Both Pretest and Posttest Sessions: Numbers of Students with Test Scores in Fall and Spring

		GRADE														
		2			3			4			5			6		
Test	Group	Both	Fall Only	Spring Only	Both	Fall Only	Spring Only	Both	Fall Only	Spring Only	Both	Fall Only	Spring Only	Both	Fall Only	Spring Only
Reading Total	Title VII With Comparison	238	9	71	610	20	28	459	25	17	127	11	12	43	2	7
	Title VII Without Comparison	371	37	62	295	13	56	482	15	21	604	32	31	298	3	30
	Non-Title VII	269	11	35	469	15	31	515	18	16	144	7	2	68	4	3
	χ^2 (Both vs. Fall Only)	= 11.2, p < .01			= .9, ns			= 3.5, ns			= 2.1, ns			= .3, ns		
	χ^2 (Both vs. Spring Only)	= 16.6, p < .001			= 45.0, p <.001			= 1.0, ns			= 8.1, p < .05			= 3.5, ns		
Mathematics Total	Title VII With Comparison	297	18	17	574	36	41	449	30	20	113	14	19	42	6	4
	Title VII Without Comparison	425	24	27	266	21	72	433	30	55	525	56	71	275	20	47
	Non-Title VII	280	14	24	426	26	47	440	35	70	137	10	5	65	1	7
	χ^2 (Both vs. Fall Only)	= .3, ns			= 9, ns			= .5, ns			= 1.6, ns			= 5.5, ns		
	χ^2 (Both vs. Spring Only)	= 1.8, ns			= 48.1, p < .001			= 26.1, p < .001			= 10.2, p < .01			= 2.1, ns		

*These tests are very approximate because some expected cell frequencies are less than 5.

TABLE II-B-7

Estimated Corrections to Expanded Standard Score Gains in Different Treatment Groups That Would Result If Omission of Tests Had Been the Same in All Treatments

Test	Group	Grade				
		2	3	4	5	6
Reading Total	Title VII With Comparison	.8	1.3	.3	.8	-1.4
	Title VII Without Comparison	.5	-.8	-.4	-.9	.8
	Non-Title VII	-.4	-.1	-.1	3.5	-1.2
Reading Total Rescored	Title VII With Comparison	2.8	.1	.7	4.8	.4
	Title VII Without Comparison	-1.3	.6	.6	-.3	.6
	Non-Title VII	-.9	0	-.3	3.3	-1.4
Reading Vocabulary	Title VII With Comparison	2.2	-.2	-.2	1.9	-.2
	Title VII Without Comparison	-.9	-.4	-.4	-.8	-.4
	Non-Title VII	-1.0	.9	-1.2	1.9	2.0
Mathematics Computation	Title VII With Comparison	-.2	.6	-.2	-1.1	-10.4
	Title VII Without Comparison	.1	-.8	-1.1	0	1.7
	Non-Title VII	.2	-.2	1.8	.6	-.9
Mathematics Total	Title VII With Comparison	.2	.6	.3	-6.4	-7.9
	Title VII Without Comparison	.2	-1.6	-2.7	.7	1.8
	Non-Title VII	-.4	.6	2.4	2.3	-3.2

Time of testing and treatment comparisons. Because of logistics and scheduling problems, not all students in the Study were tested in the same week. Thus, it is possible that students tested a few weeks later could have benefited from the extra time in school and, therefore, have scored higher. Any group tested earlier in the fall and later in the spring than other groups would likewise have a greater opportunity to show gains. The mean time of testing of each treatment group in fall and spring is shown in Table II-B-8. Although there is only one difference of more than two weeks (sixth-graders in Title VII With Comparison classrooms had three weeks more time between pretest and posttest than did their peers in Non-Title VII classrooms), the effect of even small differences on observable gains must be considered. All the differences between testing times slightly favored the Title VII students, and, if the effects were substantial, they could cast doubt on results showing positive Title VII effects. Therefore, they must be estimated.

The gains on the various CTBS tests between fall and spring were on the order of magnitude of 30 expanded standard score points. Over a 6-month period, therefore, assuming linear growth, the effect of two weeks' extra learning time would be about 2.5 expanded standard score points, not enough to cast serious doubt on significant findings in the study. Moreover, we have computed the correlations, for fall and spring, between time of testing and various test scores. These are presented in Table II-B-9. Surprisingly, all of the significant correlations for grades 4, 5, and 6 are negative: children in classrooms tested later scored lower. No explanation of the negative correlations, which occurred especially in the fall testing, is apparent; however, the negative correlations do suggest that the growth process was not strong enough within the testing period to outweigh other effects on test scores. The finding that correlations with time of testing were less positive, or more negative, in the fall than in the spring implies that classrooms later, at both pretest and posttest times, showed larger gains than classrooms tested earlier at both times. Attempts to explain this in terms of processes occurring at the project sites proved futile.

It should be noted that both the analyses of covariance and the standardized residual gain score analyses partialed out (controlled for) effects of different numbers of school days between pretest and posttest.

TABLE II-B-8

Mean Month of Testing in Fall and Spring
Hispanic Students Who Took Both Fall and Spring Tests

	GRADE				
	2	3	4	5	6
FALL:					
Title VII With Comparison	4.48	4.42	4.53	4.54	4.46
Title VII Without Comparison	4.34	4.50	4.41	4.49	4.56
Non-Title VII	4.80	4.61	4.60	4.79	4.89
s.d.=.35					
SPRING:					
Title VII With Comparison	10.18	9.99	10.07	10.22	10.21
Title VII Without Comparison	9.76	10.40	10.05	9.81	9.79
Non-Title VII	10.18	10.09	10.08	10.02	9.94
s.d.=.65					
INTERVAL: Between Fall and Spring Testing					
Title VII With Comparison	5.70	5.57	5.54	5.68	5.75
Title VII Without Comparison	5.42	5.90	5.64	5.32	5.23
Non-Title VII	5.38	5.48	5.48	5.23	5.05

Note: 4.0 means November 1 and 10.0 means May 1. CTBS Norms are published for October 15, January 15, and May 1.

TABLE II-B-9

Correlations of Time of Testing With CTBS Test Scores, for Hispanic Students

		GRADE				
		2	3	4	5	6
Reading Total	Fall	.032	-.031	-.117***	-.174***	-.117**
	Spring	.118***	.076***	.017	-.145***	-.095**
Vocabulary	Fall	.046*	-.031	-.120***	-.164***	-.135***
	Spring	.107***	.059**	.026	-.018	-.023
Mathematics Computation	Fall	.011	-.011	-.079***	-.082**	-.120**
	Spring	.021	.091***	-.013	-.049*	-.095**
Mathematics Total	Fall	.015	-.001	-.094***	-.112***	-.090*
	Spring	.031	.088***	.037	.009	-.053

* $p < .05$
** $p < .01$
*** $p < .001$

Time of testing and norm comparisons. The time of testing is of more importance in the analyses comparing Title VII gains to national norms. Testing earlier or later than the national norm testing would distort the comparison with national norms. It was decided not to correct for the discrepancy in time of testing because of the lack of clarity in the relationship between time of testing and scores (the function is clearly not one of steady, linear growth over the school year) and because the fall norms produced by CTB/McGraw-Hill are themselves interpolations. The CTBS has empirical norms for the spring only. For two of the measures used to assess Program impact in this Study, the Reading and Mathematics total scores, actual frequency distributions for all students in the Study are shown in Figures 1 and 2. In reading these figures, it should be remembered that the data from this Study are longitudinal within grades, but are cross-sectional between grades, as are the CTBS norms.

Comparison of the sample means from this Study (based on both Title VII and Non-Title VII students) with the equipercentile growth curves represented by CTBS-norm data suggests that the norms are less than ideal for longitudinal assessment of Program impact in Mathematics or in grades 2, 5, and 6 for Reading. Although the means for the distribution of scores roughly follow equipercentile curves plotted from CTBS norm tables, there is a noticeable tendency for scores in this Study to show more rapid gains from fall to spring and less rapid gains from spring to fall than did the scores derived by CTB/McGraw-Hill from the norm sample. Whether this is due to the fact that fall-spring gains were longitudinally measured in this Study whereas norms were developed cross-sectionally, or whether it is due to population differences or to some artifact of test administration, it is clear that to use published fall norms for the CTBS would lead to underestimates of gains in mathematics during the spring to fall interval and to overestimates in gains from fall to spring. Most likely this is due to the fact that students in the Title VII Impact Study took exactly the same Mathematics test in the fall and spring. It seems clear that longitudinal norms are sorely needed if Program impact assessments are to rely solely on norm-referenced comparisons. For the in-level Reading tests, unlike other

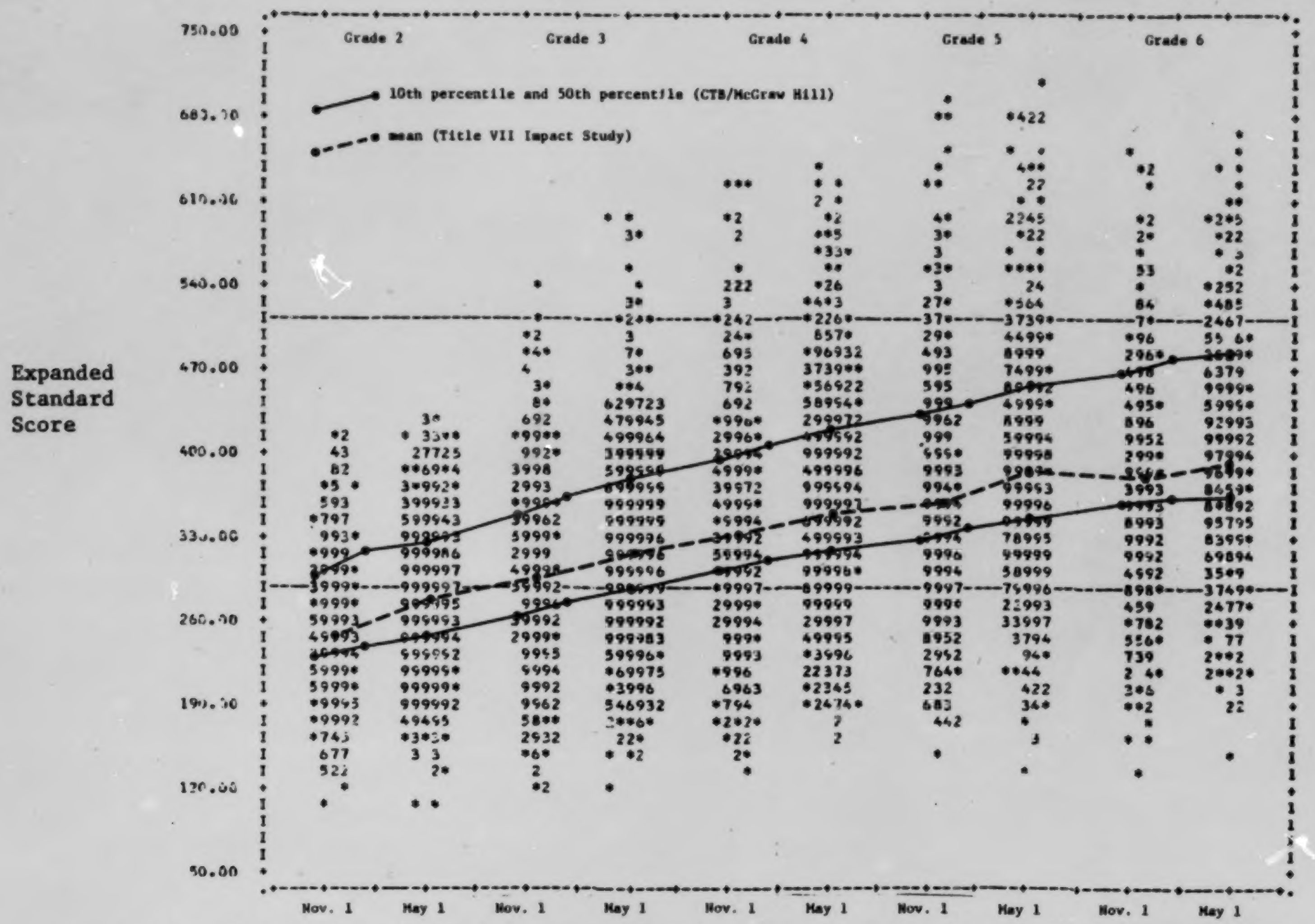


Figure 1. Distribution of total Reading scores by time of testing for all Hispanic students in the Study who were present for fall and spring testing.

Note: Each single digit column (* through 9) represents the distribution of scores of students taking the test during that week. The single digit columns on either side of the Nov. 1 and May 1 dates represent weeks before and after these dates. Each asterisk indicates a single student, numbers "2 to 8" indicate numbers of students scoring at the particular score for that particular week, and the number "9" indicates 9 students or more at that point.

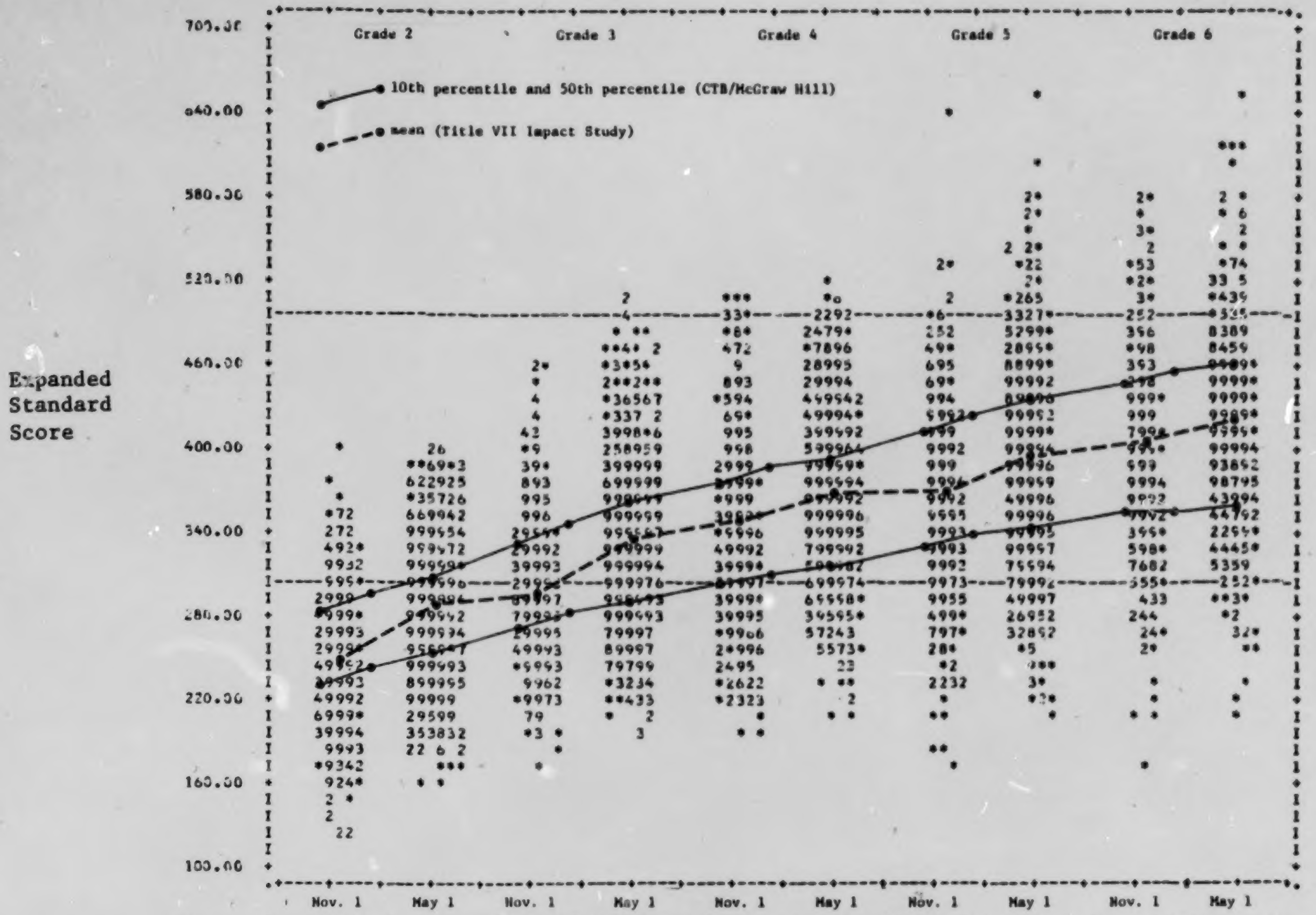


Figure 2. Distribution of total Mathematics scores by time of testing for all Hispanic students in the Study who were present for fall and spring testing.

Note: Each single digit column (* through 9) represents the distribution of scores of students taking the test during that week. The single digit columns on either side of the Nov. 1 and May 1 dates represent weeks before and after these dates. Each asterisk indicates a single student, numbers "2 to 8" indicate numbers of students scoring at the particular score for that particular week, and the number "9" indicates 9 students or more at that point.

tests, students in the present Study took separate forms in fall and spring in grades 3 through 6; and while the curves for grades 3 and 4 match the smoothness of the CTB/McGraw-Hill norms, the curves for grades 5 and 6 still show the relatively rapid fall-to-spring gain followed by a slow spring-to-fall gain, characteristic of the test-specific learning that reveals itself in longitudinal versus cross-sectional comparisons.

The implications of these discrepancies from CTB/McGraw-Hill norms for this Study are that gains in percentile scores should be interpreted cautiously, although *comparison of percentile gains betwee Title VII and Non-Title VII treatments remains an appropriate mode of analysis*.

Differential guessing rates. Although standard test administration instructions did not explicitly encourage guessing, it is possible that students may have guessed on items on the tests for which they did not know the answers. However, no correction for guessing was made by CTB/McGraw-Hill in obtaining the expanded standard scores on which the impact analyses are based. These scores are purely a function of the number of correct responses. Therefore, a student who guessed at all items he or she did not know would have received a higher score than would a student who knew the same number of items but omitted items he or she did not know. If tendency to guess were higher at posttest than at pretest (which is natural because students are likely to be more familiar and at ease with the testing situation in the spring), then artifactual gains would appear; and, if these artifactual gains varied between treatment groups, the results of Program impact analyses would be distorted.

To assess the rate of guessing, the first step was to estimate the number of items not known by each student and the number of items each student guessed on. The number of items guessed on was taken to be the number on which an overt wrong alternative was marked, times 4/3. The factor 4/3 is necessary to account for the fact that on a 4-alternative multiple-choice test, such as employed in this Study, only 3/4 of the guesses will be wrong. The number of items not known was taken to be the number of items guessed on plus the number of items omitted. Given these estimates, the second step was to calculate a tendency-to-guess for each student: the ratio of the number of items guessed on to the number of items not known. The averages of these tendency-to-guess estimates are shown in Table II-B-10. In every treatment group (Title VII With Comparison, Title VII Without Comparison, and Non-Title VII) and grade there was a clear tendency to guess rather than omit items; according to the estimates, students guessed on about 90% of the items for which they did not know the correct answer.

Tests of significance were performed for fall and spring tests separately, and there were numerous significant differences. However, inspection of the table shows some stability in group differences: groups which guessed at higher rates in the fall tended with a few exceptions to guess at higher rates in the spring so that the effect on Program impact comparisons of gains is generally small. Overall, the largest contributors to guessing variance appear to have been: (1) there was somewhat more guessing in the spring than in the fall; (2) there was somewhat more guessing on Reading than on Mathematics tests; and (3) a somewhat greater tendency to guess was shown by students in the higher grades within each test level (tests given to grade 2 and all out-of-level tests were Level C, tests given to grades 3 and 4 were Level 1, and tests given to grades 5 and 6 were Level 2).

To determine how differences in guessing rates would affect expanded scale scores, examples of guessing were compared to the tables for expanded standard scores published by CTB/McGraw-Hill. For students who knew 25% of the items on the test, a 10% difference in guessing rates (e.g., 90% vs. 80%) would result in differences of 10, 8, and 11 expanded standard score points on Levels C, 1, and 2 of the Reading (Total) test and 6, 8, and 12 points on Levels C, 1, and 2 of the Mathematics (Total) test. Because expanded scale score differences of less than 4 to 5 points are not likely to affect impact analysis conclusions, we identified only those cases where comparisons of gains between a Title VII and Non-Title VII group were subject to differential guessing (1) that was statistically significant at either the fall or spring testing and (2) where the difference in fall and spring guessing rates differed by at least 5% between treatment groups.

Table II-B-10

Proportions of Guesses Versus Omits on CTBS Tests, by Grade and Treatment Group

	GRADE																			
	2				3				4				5				6			
	In-Level		Out-of-Level		In-Level		Out-of-Level		In-Level		Out-of-Level		In-Level		Out-of-Level		In-Level		Out-of-Level	
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
Vocabulary																				
Title VII With Comparison	.89*	.93*	[a]		.88	.95*	.95	.96	.92	.95*	.89	.97	.92	.90*	.97	1.00	.90	1.00*	.89	1.00
Title VII Without Comparison	.94	.96			.84	.92	.93	.97	.93	.97	.93	.98	.90	.95	.94	.96	.93	.98	.95	.93
Non-Title VII	.92	.95			.87	.96	.92	.92	.95	.97	.99	.99	.94	.85	.99	1.00	.95	.94	-[a]	-
Reading Comprehension																				
Title VII With Comparison					.87	.92*			.92*	.93*			.91	.89*			.92*	.92		
Title VII Without Comparison					.83	.86			.94	.95			.91	.93			.88	.97		
Non-Title VII					.87	.95			.94	.96			.94	.82			.97	.93		
Reading Total																				
Title VII With Comparison	.84*	.88*			.87	.93*	.92*	.95	.92*	.94*	.91	.96	.91	.90*	.97	.97	.91	.95*	.93	.97
Title VII Without Comparison	.89	.91			.84	.88	.86	.94	.93	.96	.92	.95	.91	.93	.90	.91	.91	.97	.85	.86
Non-Title VII	.85	.89			.87	.95	.81	.89	.94	.96	.92	.91	.94	.84	.97	.94	.96	.93	-	
Mathematics Computation																				
Title VII With Comparison	.69*	.77*			.76	.87*			.86	.92			.82*	.76*			.91	.95		
Title VII Without Comparison	.75	.85			.76	.74			.83	.91			.76	.84			.83	.91		
Non-Title VII	.75	.86			.73	.89			.87	.94			.85	.79			.87	.89		
Mathematics Total																				
Title VII With Comparison	.77*	.83*			.81*	.89*			.89*	.91			.88*	.77*			.90	.96		
Title VII Without Comparison	.81	.88			.76	.80			.85	.92			.83	.89			.87	.93		
Non-Title VII	.81	.88			.78	.88			.87	.92			.90	.81			.92	.92		

*significant between groups variation, at the .05 level

[a] Blanks indicate no tests administered at that grade level. Dashes indicate tests were given but insufficient data were obtained.

There were several cases in which differential guessing was substantial enough to have affected impact analyses in the third, fifth, and sixth grades. In the third grade, there was generally a greater "guessing gain" from fall to spring in the Non-Title VII group. We mention the effects these might have on the major impact scores, the Total Reading and Mathematics Scores. For the Reading Total Score, correction for this gain would improve the mean position of those Title VII With Comparisons classrooms by about 3 points and of those Total VII Without Comparisons classrooms also by about 3 points. For the Mathematics Total Score, there would be little difference in the mean for those Title VII With Comparisons classrooms but 5 points would be added to the mean for those Title VII Without Comparisons classrooms.

In the fifth and sixth grades, the substantial differences were all in the direction of greater "guessing gains" in Title VII treatment groups. For the Reading Total Score, corrections for this gain would lower the mean position of those Title VII With Comparisons classrooms by about 8 points in grade 5 and 7 points in grade 6, and it would lower the mean position of Title VII Without Comparisons classrooms by about 12 points in grade 5 and 10 points in grade 6. For the Mathematics Total Score, the correction would lower the mean position of Title VII With Comparisons classrooms by 7 points in grade 6 and make little difference in grade 5, and it would lower the mean for Title VII Without Comparisons classrooms by about 17 points in grade 5 and 7 points in grade 6.

Generally, differential guessing effects tend not to have been large; however, in grades 3, 5, and 6 some effects were substantial enough to warrant consideration in reaching conclusions from impact comparisons. In grade 3, Non-Title VII students' gains may have benefited differentially from guessing, while in grades 5 and 6, the gains of Title VII students, especially in classrooms Without Comparisons, may have benefited from differential guessing.

Ceiling effects. The question to be addressed in this section is whether the scores of some students in the Study were limited by their being given too easy a test form. If a substantial number of subjects obtained perfect scores on the test forms they were given, this would have complex effects on the interpretation of the impact evaluation analyses. If these students actually scored perfectly on the easy level of a test and should have taken a higher level of the test, the evaluation results could be biased in favor of groups whose teachers were less likely to assign out-of-level tests. In fact, out-of-level tests were given far more frequently by teachers in Title VII classrooms than by teachers in comparison classrooms.

No single test for ceiling effects is perfectly valid. A small percentage of students would be expected to achieve exactly the maximum, the same as any other score; and some students who scored just below the maximum might have been hurt by the ceiling even though they missed an item or two. A common measure of ceiling effect is the skewness of the score distribution. If the scores are bunched near the maximum, which is an indication of a substantial ceiling effect, the skewness of the distribution will be negative.* Our approach is therefore to identify tests on which there is substantial negative skewness (<-.3) and on which at least two individuals scored at the maximum for the test in the spring. Any comparisons between groups with differential ceiling effects would then be interpreted only with the qualification that they might have been different were there no ceiling effects.

Fortunately, as shown in Tables II-B-11, 12, and 13, there were only a few cases of ceiling effects, and they tended to be on the same tests and in the same grades for Title VII students in classrooms With Comparison, Title VII students in classrooms Without Comparisons, and Non-Title VII students.

Specifically, the SSL test appears to have been subject to ceiling effects with typically 10% to 15% of the students scoring at the maximum score across the grades in both Title VII and Non-Title VII classrooms. While the ESL had no students scoring at the maximum score, there was skewness which suggests ceiling effects. There was a ceiling effect for both Title VII and Non-Title VII students in the fourth grade

---

* The skewness, or third standardized central moment, of a symmetric distribution is zero. The skewness for a "saw-tooth" distribution is +.57.

TABLE II-B-11

Ceiling Effects: Skewness and Number of Perfect Scores Obtained, By Hispanic Students in Each Grade, in Title VII With Comparison Classrooms

Variables		GRADE									
		2		3		4		5		6	
		Skewness[a]	No. at Max.[b]	Skewness	No. at Max.	Skewness	No. at Max.	Skewness	No. at Max.	Skewness	No. at Max.
Vocabulary (in level)	Fall	>0	1(.3%)	>0	0	>0	0	>0	0	-.1	0
	Spring	>0	1(.3%)	>0	0	>0	0	>0	0	>0	0
Vocabulary (out-of-level)	Fall	--	--	>0	0	>0	0	-.1	0	>0	1(7%)
	Spring	--	--	>0	1(1%)	>0	0	-.2	0	>0	1(7%)
Sentences (in level)	Fall	-.1	0	--	--	--	--	--	--	--	--
	Spring	>0	1(.4%)	--	--	--	--	--	--	--	--
Sentences (out-of-level)	Fall	--	--	>0	0	>0	0	>0	0	>0	0
	Spring	--	--	>0	3(2%)	>0	0	>0	0	>0	0
Comprehension (in level)	Fall	--	--	>0	0	>0	0	-.1	0	-.4	0
	Spring	--	--	>0	0	>0	0	0.3	0	.7	0
Reading Total (in level)	Fall	>0	0	>0	0	>0	0	-.1	0	-.2	0
	Spring	>0	1(.4%)	>0	0	>0	0	>0	0	.5	0
Reading Total (out-of-level)	Fall	--	--	>0	0	>0	0	>0	0	>0	0
	Spring	--	--	>0	1(1%)	>0	0	-.4	0	>0	0
Mathematics Computation (in level)	Fall	>0	0	>0	1(.2%)	>0	13(3%)	-.1	0	-.4	0
	Spring	-.2	8(3%)	>0	3(.5%)	-.2	31(7%)	>0	1(1%)	>0	0
Mathematics Total (in level)	Fall	>0	0	>0	0	>0	0	-.2	0	-.1	0
	Spring	-.01	1(.3%)	>0	0	>0	0	-.2	0	>0	0
Prueba de lectura (in level)	Fall	>0	0	>0	0	>0	0	-.8	0	-.4	0
	Spring	>0	0	>0	0	-.2	0	>0	0	>0	0
English as a Second Language (in level)	Fall	-.7	0	-.6	0	-.9	0	-1.3	0	ID[c]	ID
	Spring	-1.0	0	-.6	0	-1.1	0	-1.2	0	ID	ID
Spanish as a Second Language (in level)	Fall	-1.6	1(1%)	-1.6	8(2%)	-2.5	24(6%)	-2.8	9(8%)	-3.1	8(27%)
	Spring	-.7	3(3%)	-4.0	68(13%)	-5.2	65(17%)	-3.3	20(17%)	-3.0	7(23%)

---

[a] The skewness is the third central moment divided by the cube of the standard deviation.

[b] The percentage who achieved a maximal score is shown in parentheses.

[c] Insufficient data for test.

TABLE II-B-12

Ceiling Effects: Skewness and Number of Perfect Scores Obtained, By Hispanic Students in Each Grade, in Title VII Without Comparison Classrooms

Variables		GRADE 2		3		4		5		6	
		Skewness[a]	No. at Max.[b]	Skewness	No. at Max.	Skewness	No. at Max.	Skewness	No. at Max.	Skewness	No. at Max.
Vocabulary (in level)	**Fall**	>0	0	>0	0	>0	1(.3%)	>0	2(.4%)	>0	0
	Spring	-.05	1(.2%)	>0	0	>0	0	>0	0	>0	0
Vocabulary (out-of-level)	**Fall**	--	--	>0	0	>0	0	>0	0	>0	6(11%)
	Spring	--	--	>0	0	>0	1(1%)	>0	6(5%)	>0	4(7%)
Sentences (in level)	**Fall**	-.1	0	--	--	--	--	--	--	--	--
	Spring	-.4	1(.2%)	--	--	--	--	--	--	--	--
Sentences (out-of-level)	**Fall**	--	--	>0	0	>0	0	>0	1(1%)	>0	0
	Spring	--	--	>0	0	>0	0	>0	0	>0	0
Comprehension (in level)	**Fall**	--	--	>0	0	>0	1(.3%)	>0	0	>0	0
	Spring	--	--	>0	0	>0	1(.3%)	>0	0	>0	0
Reading Total (in level)	**Fall**	>0	0	>0	0	>0	1(.3%)	>0	0	>0	0
	Spring	-.2	0	>0	0	>0	0	>0	0	>0	0
Reading Total (out-of-level)	**Fall**	--	--	>0	0	>0	0	>0	0	>0	0
	Spring	--	--	-.04	0	>0	0	>0	0	>0	0
Mathematics Computation (in level)	**Fall**	>0	0	>0	1(.3%)	>0	15(3%)	-.2	0	-.1	1(.3%)
	Spring	-.1	7(2%)	>0	2(.7%)	-.2	39(8%)	-.1	0	-.2	0
Mathematics Total (in level)	**Fall**	-.1	0	>0	0	>0	1(.2%)	-.1	0	>0	0
	Spring	-.03	1(.2%)	>0	0	>0	2(.5%)	-.1	0	-.2	0
Prueba de lectura (in level)	**Fall**	>0	0	>0	0	-.05	0	-.4	0	-.7	0
	Spring	>0	0	>0	0	-.6	0	>0	0	>0	0
English as a Second Language (in level)	**Fall**	-.4	0	-.2	0	-.2	0	-.6	0	-.7	0
	Spring	-1.0	0	-1.2	0	-1.3	0	-1.2	2(2%)	-1.0	3(6%)
Spanish as a Second Language (in level)	**Fall**	-3.2	11(4%)	-1.1	2(1%)	-2.4	22(6%)	-3.7	36(7%)	-3.9	38(14%)
	Spring	-2.0	25(10%)	-2.5	22(11%)	-3.8	49(13%)	-3.3	80(16%)	-3.5	40(15%)

[a] The skewness is the third central moment divided by the cube of the standard deviation.

[b] The percentage who achieved a maximal score is shown in parentheses.

TABLE II-B-13

Ceiling Effects: Skewness and Number of Perfect Scores Obtained, By Hispanic Students in Each Grade, in Non-Title VII Classrooms

Variables		GRADE									
		2		3		4		5		6	
		Skewness[a]	No. at Max.[b]	Skewness	No. at Max.	Skewness	No. at Max.	Skewness	No. at Max.	Skewness	No. at Max.
Vocabulary (in level)	**Fall**	>0	0	>0	0	>0	0	>0	0	-.2	0
	Spring	>0	4(1%)	>0	2(.4%)	>0	0	>0	0	>0	0
Vocabulary (out-of-level)	**Fall**	--	--	>0	0	>0	0	-.2	0	ID[c]	ID
	Spring	--	--	>0	0	-.4	0	-.1	0	ID	ID
Sentences (in level)	**Fall**	>0	0	--	--	--	--	--	--	--	--
	Spring	-.2	6(2%)	--	--	--	--	--	--	--	--
Sentences (out-of-level)	**Fall**	--	--	>0	0	>0	0	-.7	0	ID	ID
	Spring	--	--	-.2	0	>0	0	>0	0	ID	ID
Comprehension (in level)	**Fall**	--	--	>0	0	>0	0	>0	0	>0	0
	Spring	--	--	>0	0	>0	0	>0	0	>0	0
Reading Total (in level)	**Fall**	>0	0	>0	0	>0	0	>0	0	-.3	0
	Spring	-.03	0	>0	0	>0	0	>0	0	-.1	0
Reading Total (out-of-level)	**Fall**	--	--	-.1	0	-.3	0	-.6	0	ID	ID
	Spring	--	--	>0	0	-.2	0	>0	0	ID	ID
Mathematics Computation (in level)	**Fall**	>0	0	>0	0	>0	10(2%)	-.5	0	>0	0
	Spring	>0	6(2%)	>0	7(2%)	-.4	30(6%)	-.1	0	>0	0
Mathematics Total (in level)	**Fall**	-.03	0	>0	0	-.01	0	-.3	0	>0	0
	Spring	>0	0	>0	0	-.06	0	-.2	0	>0	0
Prueba de lectura (in level)	**Fall**	>0	0	>0	0	>0	0	>0	0	-.2	0
	Spring	>0	0	>0	0	>0	0	-.1	0	>0	0
English as a Second Language (in level)	**Fall**	-.2	0	-.8	0	-.3	0	-.7	0	ID	ID
	Spring	-.8	0	-1.1	0	-1.0	0	-.8	0	ID	ID
Spanish as a Second Language (in level)	**Fall**	-2.2	1(.4%)	-1.4	11(2%)	-2.7	18(4%)	-1.5	9(7%)	-2.3	7(10%
	Spring	-1.9	2(.8%)	-3.3	46(10%)	-4.2	67(14%)	-2.0	14(11%)	-2.2	14(20%

---

[a] The skewness is the third central moment divided by the cube of the standard deviation.

[b] The percentage who achieved a maximal score is shown in parentheses.

[c] Insufficient data for test.

for the Mathematics Computation test, with about 7% of both Title VII and Non-Title VII students scoring at the maximum score. There were no substantial ceiling effects for any of the CTBS Reading scores on either the in-level or out-of-level test forms. *Since there appear to be no differential ceiling effects between Title VII classrooms and Non-Title VII. classrooms, comparisons between these groups are not affected by the ceiling effects found.*

Sensitivity of ESL and CTBS Reading tests to gains. The CTBS Reading tests were developed in such a way as to be sensitive to differences between students rather than to be sensitive to gains within students. Thus, like other nationally standardized tests, they were not designed to measure sensitively the gains due to the effects of a particular treatment. It has been suggested that the ESL test may be a more sensitive measure of Title VII gains than the CTBS battery, especially for students of limited English-speaking ability. Therefore the ESL test was used in the Program impact comparisons conducted for this Volume. However, there do not exist adequate national norms for the ESL test to which Title VII gains can be compared. Thus, gains on the ESL test can only be compared between the Title VII and Non-Title VII classrooms in this study, and few students in the latter group took the ESL test.

To determine the relative sensitivity of the ESL to gains, a comparison was made between gains on the ESL and gains on the Vocabulary and Reading Total scores on the CTBS test battery. The gains for Title VII students, expressed in units of standard deviations of pretest scores, are shown in Table II-B-14. *When measured from fall to spring, the ESL test appears to be substantially more sensitive to gains than the CTBS Reading test, especially for second-, third-, and sixth-graders. When measured over a full year, from fall to fall, however, there is no consistent difference in sensitivity*. In the period between the spring test and the following fall test, student gains for second- and third-graders were apparently more sensitively measured by the CTBS Reading test.

It should be noted that the only students taking the ESL test were those who were judged by their teachers to be essentially Spanish

TABLE II-B-14

Fall-to-Spring and Fall-to-Fall Gains on the ESL and CTBS Reading Tests, Expressed in Pretest Standard Deviation Units, for Title VII Hispanic Students Who Took Both Tests

GAINS	GRADES				
	2	3	4	5	6
Fall-to-Spring					
ESL	.77	.98	.81	.55	.60
CTBS Reading Total	.34	.53	.70	.47	.27
CTBS Reading Vocabulary	.48	.59	.65	.40	.14
Fall-to-Fall					
ESL	1.22	1.26			
CTBS Reading Total	1.06	1.42			
CTBS Reading Vocabulary	1.38	1.23			

monolingual for test-taking purposes. While there were relatively few of these students in the Title VII projects, they were the students with very severe English language needs, so relative gains in this group should be especially important to the Title VII.

Out-of-level testing. The data collection strategy allowed for the administration of lower-than-grade-level Reading and Vocabulary tests. The decision to administer an out-of-level Reading test was made by each student's teacher. It was necessary to check how much difference there might be in test scores as a function of their coming from in-level or out-of-level test forms. Specifically, Level C of the CTBS Reading battery was administered to a few children in grades 3 through 6 (as well as to all second-graders in the Study for whom it was an in-level test). The impact analyses conducted by the Impact Study, however, combined scores from both in-level and out-of-level tests given to students at the same grade level. Since such analyses relied upon the expanded scale score mapping developed by CTB/McGraw-Hill to allow articulation of CTBS scores across grade levels, and, since all such procedures are fallible, some conclusions from the Study were open to question.

To test for out-of-level test effects, the mean spring posttest scores obtained by those who took out-of-level tests were compared with estimates of the scores they would have achieved had they taken in-level tests. To obtain the estimates, the regression of posttest on pretests was computed based only on in-level test scores. This regression equation could be used to predict the average spring posttest score obtained by those who obtained any particular score on the pretest in the fall. In particular, the average spring posttest score could be predicted for those who scored in the fall at the mean of the out-of-level test-takers. That prediction provided the needed estimate of how well the out-of-level test takers would have performed in the spring had they taken the in-level test both times.

The results of the comparison are shown in Table II-B-15. In every case, the actual mean posttest score obtained on out-of-level tests was lower than the estimate of what the mean would have been had these children taken in-level tests. This was equally true for students in

TABLE II-B-15

Spring Test Scores Obtained by Students Who Took Out-of-Level Tests, Compared to Estimates of Scores They Would Have Achieved on In-Level Tests, by Grade

	GRADE			
READING TOTAL SCORE	3	4	5	6
Title VII:				
Out-of-Level Spring Test Score	266.4	296.2	308.9	313.6
N	233	191	126	70
Estimated In-Level Spring Test Score	281.8	302.9	333.1	320.4
N	811	884	741	360
Non-Title VII:				
Out-of-Level Spring Test Score	289.6	270.5	315.3	286.0
N	14	15	15	1
Estimated In-Level Spring Test Score	302.2	274.2	347.6	392.5
N	455	500	129	67
READING TOTAL RESCORED				
Title VII:				
Out-of-Level Spring Test Score	262.5	294.8	303.8	313.4
N	261	197	135	71
Estimated In-Level Spring Test Score	276.9	299.6	327.3	318.7
N	811	884	741	360
Non-Title VII:				
Out-of-Level Spring Test Score	272.2	257.1	315.3	286.0
N	20	19	15	1
Estimated In-Level Spring Test Score	285.2	263.7	347.6	392.5
N	455	500	129	67
VOCABULARY SCORE				
Title VII:				
Out-of Level Spring Test Score	266.8	294.3	303.1	310.4
N	265	197	137	72
Estimated In-Level Spring Test Score	288.5	306.0	310.3	311.8
N	828	894	749	377
Non-Title VII:				
Out-of-Level Spring Test Score	276.1	254.7	293.9	281.0
N	20	21	15	1
Estimated In-Level Spring Test Score	292.0	272.3	315.2	365.1
N	468	502	129	68

Title VII and Non-Title VII classrooms. Because a larger percentage of students in Title VII classrooms than of those in Non-Title VII classrooms took out-of-level tests, however, this difference may have affected the outcome of impact analyses. It was therefore necessary to estimate how much the mean posttest scores would have increased in Title VII classrooms relative to Non-Title VII classrooms if no out-of-level tests had been given. The results are shown in Table II-B-16. The effects are not large because most children in both groups took in-level tests and because the bias was in the same direction for both groups. It appears that only in grade 3 is there any substantial effect; the average estimate of the effect of Title VII on Reading Total and Vocabulary Scores in third grade may underestimate actual gains by 3 to 5 expanded standard score points.

TABLE II-B-16

Estimates of the Amount by Which Out-of-Level Testing May Have Caused Underestimation of the Impact of Title VII

CTBS SCORE	GRADE			
	3	4	5	6
Reading Total	3.0	1.1	0.1	-0.5
Reading Total Rescored	3.0	0.7	0.2	-0.7
Vocabulary Score	4.6	1.4	-1.1	-1.0

Note: Units are expanded standard score points

This effect, about .1 standard deviation, is not large. Moreover, it is probably an overestimate of the actual distortion in the impact analyses because some of the in-level/out-of-level variance was undoubtedly partialed out in the ANCOVA and standardized residual gain score analyses. (As discussed later, the language factors used as covariates in all impact analyses were highly correlated with the type of test packet taken by a student.) Thus, the possibility of distortion from out-of-level testing only appears to be of possible concern in the interpretation of Title VII/Non-Title VII comparisons of Reading and Vocabulary gains for third-graders.

Number of boys and girls in each treatment. Analysis of Title VII Program impact in Volume I did not include separate analyses for males and females. Since some reviewers questioned this and also pointed out the relatively large amount of missing data about the sex of the student, it was decided to attempt to determine the sex of the students for whom sex data was not available on their questionnaires and to examine the possible differences between Title VII and Non-Title VII student populations related to this sex variable. Staff familiar with both Hispanic and non-Hispanic first names examined each of the student names in the Impact Study sample, and a determination was made whether the name was a boy's or a girl's. The decision was straightforward for almot all of the names. For a few students, the name did not yield adequate information about the student's sex. For these, no sex determination was made. By following the procedures just described, sex determination was made for about 98% of the students in the sample. Thus the amount of missing information was reduced to generally less than 2% from the percentage shown in Volume I.

An examination of the proportions of males and females by grades within Title VII With Comparison, Title VII Without Comparison, Title VII Pooled, and Non-Title VII groups revealed an essentially even distribution of males and females within grades and within treatment classification. It seems reasonable, therefore, to assume that sex differences were not associated with treatment classification, and thus no further analyses by sex appear necessary to assess overall Title VII impact.

Program Impact Assessment

Analytic approach and methods. A decade of experience in the evaluation of federal education programs has shown that no single method of statistical analysis can be counted on to permit the evaluator to reach completely valid and uncontestable conclusions, given the required use of a quasi-experimental evaluation design. This is because statistical analytic methods are developed to apply to given idealized situations and because the organization and implementation of educational programs are only rough approximations to the idealized situation upon which any one method is based. Unfortunately, the assumptions underlying such methods cannot be ignored since the literature is replete with examples of how serious distortions to conclusions can result from the inappropriate use of a given method. What, then, can be done when one desires credible conclusions given data that do not satisfy all of the statistical assumptions required by any single particular method?

One state-of-the-art solution to this problem is to (1) perform several kinds of statistical analyses, (2) examine empirically (if possible) the assumptions underlying each method, (3) look for converging lines of evidence across methods and groups of students, and (4) limit conclusions to those findings that appear plausible in terms of all the evidence that is compiled. As was the case in the analyses of growth in achievement between fall 1975 and fall 1976, the findings derived from different analytic methods were also used to "triangulate" on conclusions regarding Program impact between fall 1975 and spring 1976. Thus, in the in-depth analyses reported here, three different methods were used to assess Program impact on gains from fall 1975 to spring 1976 for Hispanic students--standardized residual gain score analysis, analysis of covariance (ANCOVA), and comparison of pretest and posttest percentile ranks. The results of each of these analyses are discussed separately below and then summarized and related to the issues discussed in the previous sections of this volume.

All analyses were carried out both separately for Title VII classrooms With Comparisons and Title VII classrooms Without Comparisons and with these groups pooled (i.e., Title VII [Pooled]). As discussed in Section II-A, the meanings of these different comparisons vary. The most straightforward interpretation can be made for analyses involving Title VII With Comparison classrooms and Non-Title VII classrooms because community and regional effects are matched for these groups. The other comparisons, which include Title VII classrooms Without Comparisons, serve primarily to add generality to this primary comparison. All analyses were restricted to Hispanic students who were present during both fall 1975 and spring 1976 and who had both a fall 1975 and a spring 1976 score for a given outcome variable. The number of students in each grade and treatment is shown in Table II-B-17, both before and after restriction to those with sufficient data for analysis.

Outcome variables analyzed. Four domains of impact were considered in these analyses: English Language Arts, Mathematics, Attitudes, and Spanish Language Arts. The four measures of English Language Arts used were the CTBS Vocabulary Expanded Standard Score, the CTBS Total Reading Expanded Standard Score, the CTBS Total Reading Expanded Standard Score (Rescored), and the Prueba de Comprensión Auditiva Inglés (i.e., English as a Second Language [ESL]) Standard Score. The ESL test differs from the other three in that it measures understanding of spoken rather than written English and that it was administered only to those students judged by their teachers to be monolingual Spanish for test-taking purposes. The two Mathematics scores used were the CTBS Mathematics Computation Expanded Standard Score and the CTBS Total Mathematics Expanded Standard Score. Three attitudes were measured: Attitude Toward English, Attitude Toward Spanish, and Attitude Toward School. Finally, two Spanish Language Arts measures were analyzed: an orally administered Spanish as a Second Language (SSL) test (given to all students to whom the ESL test was not given) and the Prueba de Lectura, a test of Spanish Reading (given to all students except those judged to be English monolingual by their teachers). Total raw scores for both of the Spanish instruments were analyzed. As noted in Volume I, lexically biased items were not included in the computation of the Prueba de Lectura total raw score.

Standardized residual gain score analysis. Correlations between Title VII classroom membership and fall and spring test scores are shown in Tables II-B-18, II-B-19, and II-B-20. Each correlation coefficient

TABLE II-B-17

Sample Selection Stages and Numbers of Students by Ethnic Group, Fall 1975 to Spring 1976 Achievement Analysis, Grades 2, 3, 4, 5, and 6

Successive Selection Criteria	GRADE 2				GRADE 3				GRADE 4				GRADE 5				GRADE 6			
	Hispanic	Non-Hispanic White	Black	Other	Hispanic	Non-Hispanic White	Black	Other	Hispanic	Non-Hispanic White	Black	Other	Hispanic	Non-Hispanic White	Black	Other	Hispanic	Non-Hispanic White	Black	Other
Impact Study Data Base Master Files																				
Title VII Pooled	1107	102	110	217	1340	174	144	193	1359	147	113	129	1054	99	70	167	620	84	25	110
With Comparison	428	43	53	34	820	102	73	59	683	53	49	33	186	27	19	18	62	19	5	3
Without Comparison	679	59	57	183	520	72	71	134	676	94	64	96	868	72	51	149	558	65	20	107
Non-Title VII	505	143	114	70	680	202	111	105	699	200	121	63	212	110	55	34	144	80	44	17
Impact Study Data Base Excluding Non-Title VII Dallas Students Inadvertently Included in Original Data Base																				
Title VII Pooled	1107	102	110	217	1340	174	144	193	1359	147	113	129	1054	99	70	167	620	84	25	110
With Comparison	428	43	53	34	820	102	73	59	683	53	49	33	186	27	19	18	62	19	5	3
Without Comparison	679	59	57	183	520	72	71	134	676	94	64	96	868	72	51	149	558	65	20	107
Non-Title VII	456	123	100	65	654	188	108	100	676	195	120	63	195	102	55	31	108	74	40	15
Impact Study Data Base Excluding Virgin Islands Students																				
Title VII Pooled	1080	102	92	210	1319	174	120	188	1312	147	113	125	1054	99	70	167	620	84	25	110
With Comparison	401	43	35	27	799	102	49	54	636	53	49	29	186	27	19	18	62	19	5	3
Without Comparison	679	59	57	183	520	72	71	134	676	94	64	96	868	72	51	149	558	65	20	107
Non Title VII	447	123	65	60	650	188	83	77	661	195	82	61	195	102	55	31	108	74	40	15
Students Present During Fall 1975 Data Collection																				
Title VII Pooled	938	94	84	157	1180	159	104	138	1173	133	103	89	915	88	60	128	496	76	23	94
With Comparison	361	39	33	19	738	91	39	32	578	48	46	11	170	20	16	6	57	15	4	2
Without Comparison	577	55	51	138	442	68	65	106	595	85	57	78	745	68	44	122	439	61	19	92
Non-Title VII	395	104	56	49	591	165	74	61	615	180	76	48	185	89	46	22	99	71	37	8
Students Present During Fall 1975 and Spring 1976																				
Title VII Pooled	813 (87)[a]	79 (84)	74 (88)	90 (57)	1031 (87)	132 (83)	89 (86)	116 (86)	1025 (87)	115 (86)	85 (83)	63 (71)	827 (90)	73 (83)	51 (85)	107 (84)	400 (81)	67 (88)	20 (87)	52 (55)
With Comparison	333 (92)	30 (77)	30 (91)	15 (79)	660 (89)	72 (79)	34 (87)	25 (78)	502 (87)	43 (90)	40 (87)	8 (73)	155 (91)	16 (80)	13 (81)	6 (100)	54 (95)	14 (93)	4 (100)	0 (0)
Without Comparison	480 (83)	49 (89)	44 (86)	75 (54)	371 (84)	60 (88)	55 (85)	93 (88)	523 (88)	72 (85)	45 (79)	55 (71)	672 (90)	57 (84)	38 (86)	101 (83)	346 (79)	53 (87)	16 (84)	52 (57)
Non-Title VII	321 (81)	92 (88)	50 (89)	33 (67)	520 (88)	125 (76)	61 (82)	43 (70)	551 (90)	135 (75)	71 (93)	35 (73)	154 (83)	60 (67)	42 (91)	9 (41)	76 (77)	46 (65)	31 (84)	5 (63)

[a] In parentheses is the percent of students present in fall 1975 who were also present in spring 1976. If this percent is subtracted from 100, the result is the percent of fall 1975 to spring 1976 attrition.

measures the standardized difference between mean Title VII and mean Non-Title VII standard scores, where each pretest and posttest standard score has been residualized with respect to SES, number of school days between testing, Preference for English versus Spanish, Use of Both English and Spanish, and the product of the latter two language use indices.

We consider first performance differences between Title VII With Comparisons classrooms and Non-Title VII classrooms because such comparisons are not confounded by community effects (see Table II-B-18). Examination of the statistically significant results for individual grades shows that (1) Title VII treatments in projects With Comparisons at the fourth-grade level were more effective than Non-Title VII treatments for improving English Reading (as measured by the CTBS); (2) Title VII treatments were either less effective or no more effective than Non-Title VII treatments for improving English Reading (as measured by the CTBS) in grades 2, 3, 5 and 6; (3) Title VII treatments in grades 3 and 4 were relatively effective in teaching the skills measured by the ESL test; (4) Title VII treatments were relatively more effective than Non-Title VII treatments in teaching Mathematics at the second-grade level and the fifth-grade level; (5) Title VII treatments were more effective than Non-Title VII treatments in teaching skills measured by the SSL test in grade 2; and (6) relative to Non-Title VII, Title VII treatments tended to improve the Attitude Toward Spanish of fifth-graders and the Attitude Toward School of sixth-graders.

The complex pattern of findings for different grade levels shown in Table II-B-18 is more than likely due to differences in the strategies and objectives of Title VII projects and teachers at different grade levels. Those that are corroborated by other analyses are discussed later in the summary of impact findings. Also of interest is the overall effect of the Program across five grade levels. Results pooled across grades are shown in the Table II-B-18. These, it must be cautioned, are not longitudinal results because they reflect only on aggregation of one year's fall-to-spring gains in five different grades. However, they do help us to understand how a project that has different objectives and achievements at different grade levels is operating overall. Although

TABLE II-B-18

Fall and Spring Treatment-Test Score Partial Correlations[a] and Standardized Residual Gain Score Analysis for Hispanic Students in Title VII With Comparisons versus Non-Title VII Classrooms

Variables	Grade 2			Grade 3			Grade 4			Grade 5			Grade 6			Pooled Across Grades		
	r Fall	r Spring	t[c]	r Fall	r Spring	t	r Fall	r Spring	t	r Fall	r Spring	t	r Fall	r Spring	t	r Fall	r Spring	t
Reading Total	.07	-.10	-4.772***	.03	-.07	-3.945***	.00	.12	6.004***	.00	-.05	-.912	.16	.08	-0.977	.03	.00	-1.938*
Reading Total Rescored	.06	-.09	-4.122***	.03	-.07	-4.081***	.00	.13	6.105***	-.01	-.05	-.816	.10	.06	-0.481	.02	.00	-1.485
Reading Vocabulary	.08	-.08	-4.300***	.03	-.04	-2.767**	.00	.14	5.779***	-.02	.04	1.531	.08	.20	1.528	.03	.04	.675
Mathematics Computation	.02	.10	2.215*	-.01	.03	1.250	.08	.08	-0.104	.00	.18	4.347***	.17	.08	-1.318	.02	.07	3.131**
Mathematics Total	.11	.09	-0.550	.03	.06	1.036	.10	.11	0.573	.04	.19	3.524***	.15	.09	-0.953	.07	.09	2.107*
English as a Second Language	.08	.10	0.290	-.14	.24	4.218***	.24	.40	1.475*	ID[d]	ID[d]	ID[d]	ID[d]	ID[d]	ID[d]	.08	.21	2.789**
Spanish as a Second Language	.06	.20	3.099**	.08	.12	0.985	.02	.06	1.087	.32	.26	-1.554	.15	.02	-1.585	.08	.12	1.850
Prueba de Lectura	.24	.18	-1.260	.08	.10	0.407	.12	.15	0.773	-.02	.02	0.306	.03	.07	0.238	.09	.11	.754
Attitude Toward Spanish	.20	.26	1.190	.15	.18	0.925	.16	.19	0.939	.17	.30	2.160*	.10	.20	1.116	.16	.21	2.447*
Attitude Toward English	.03	.05	0.563	.01	.01	0.000	.04	.09	1.473	.11	.07	-0.615	.18	.20	0.289	.04	.06	.942
Attitude Toward School	.10	.18	1.620	.00	.01	0.268	.08	.05	-0.921	.09	.18	1.345	.09	.31	2.564*	.06	.09	1.140

---

[a] The effects of SES, number of days between testing, Factor Score 1, Factor Score 2, and the product of the LESA factors have been partialed out.

[b] Only students with both fall and spring scores are used in this analysis.

[c] The t-test is for differential treatment gains indicated by increased correlations. A positive t indicates that gains were greater in the Title VII group.

[d] Insufficient data.

* = $p < .05$
** = $p < .01$
*** = $p < .002$
**** = $p < .0001$

155

~~58~~

TABLE II-B-19

Fall and Spring Treatment-Test Score Partial Correlations[a] and Standardized Residual Gain Score Analysis for Hispanic Students in Title VII Without Comparisons versus Non-Title VII Classrooms[b]

Variables	Grade 2			Grade 3			Grade 4			Grade 5			Grade 6			Pooled Across Grades		
	r Fall	r Spring	t[c]	r Fall	r Spring	t	r Fall	r Spring	t	r Fall	r Spring	t	r Fall	r Spring	t	r Fall	r Spring	t
Reading Total	.07	.02	-1.662	-.12	-.22	-3.507***	.08	.13	2.586**	-.12	-.11	0.289	.00	-.09	-2.336*	.00	-.02	-1.598
Reading Total Rescored	.09	.00	-2.727**	-.15	-.23	-2.962**	.08	.13	2.951**	-.13	-.12	0.303	.00	-.09	-2.336*	-.01	-.03	-1.674
Reading Vocabulary	.07	-.01	-2.405*	-.09	-.15	-1.912	.10	.16	3.098**	-.09	-.10	-.234	.06	.07	.076	.02	.01	-.868
Mathematics Computation	.01	.05	1.067	-.08	-.04	1.056	.08	.11	1.587	-.12	-.06	2.186*	.01	.06	1.000	-.01	.03	2.944**
Mathematics Total	.08	.07	-0.326	-.06	.00	2.252*	.14	.19	2.748**	-.12	-.05	2.415*	-.02	.04	1.446	.02	.07	3.722****
English as a Second Language	.04	.01	-0.433	-.17	.12	3.073**	-.04	.18	1.640	.04	.05	.135	ID[d]	ID[d]	ID[d]	-.03	.06	2.376*
Spanish as a Second Language	.23	.36	3.340***	-.01	-.02	-.187	.04	.02	-.500	.25	.23	-.775	.18	.17	-.241	.10	.16	3.241***
Prueba de Lectura	.18	.23	.754	.08	.14	.902	.16	.23	1.609	-.10	-.09	.207	.05	-.03	-.917	.09	.14	1.898
Attitude Toward Spanish	.01	.06	1.118	.20	.16	-1.089	.23	.24	.247	.05	.09	1.169	-.03	.03	1.175	.13	.14	.467
Attitude Toward English	-.07	-.10	-0.534	-.03	-.01	.511	-.04	.04	2.253*	.08	.10	.428	-.03	.10	2.563*	-.02	.01	1.557
Attitude Toward School	.01	-.03	-0.723	-.06	.00	1.274	.02	.03	.404	.02	.09	1.684	-.08	.04	2.116*	-.01	.02	1.283

---

[a] The effects of SES, number of days between testing, LESA Factor Score 1, Factor Score 2, and the product of the factors have been partialed out.

[b] Only students with both fall and spring scores are used in this analysis.

[c] The t-test is for differential treatment gains indicated by increased correlations. A positive t indicates that gains were greater in the Title VII group.

[d] Insufficient data.

* = $p < .05$
** = $p < .01$
*** = $p < .002$
**** = $p < .0001$

TABLE II-B-20

Fall and Spring Treatment-Test Score Partial Correlations[a] and Standardized Residual Gain Score Analysis for Hispanic Students in Title VII Pooled versus Non-Title VII Classrooms[b]

Variables	Grade 2			Grade 3			Grade 4			Grade 5			Grade 6			Pooled Across Grades		
	r Fall	r Spring	t[c]	r Fall	r Spring	t	r Fall	r Spring	t	r Fall	r Spring	t	r Fall	r Spring	t	r Fall	r Spring	t
Reading Total	.07	-.02	-3.177***	-.02	-.11	-4.333***	.04	.12	5.066***	-.09	-.09	.021	.01	-.07	-2.355*	.01	-.01	-2.075*
Reading Total Rescored	.07	-.02	-3.426***	-.02	-.11	-4.177***	.04	.12	5.282***	-.10	-.09	.059	.00	-.08	-2.204*	.01	-.01	-1.987*
Reading Vocabulary	.07	-.03	-3.576***	.00	-.07	-2.944**	.05	.14	5.239***	-.07	-.06	262	.05	.06	.262	.02	.02	-.622
Mathematics Computation	.01	.06	1.711	-.03	.00	1.040	.07	.09	.983	-.09	-.02	2.853**	.02	.06	1.125	.00	.04	3.035**
Mathematics Total	.08	.07	-.422	.00	.03	1.307	.10	.14	2.012*	-.08	-.01	2.888**	-.01	.04	1.592	.04	.07	2.960**
English as a Second Language	.05	.05	.015	-.11	.13	3.491***	.07	.24	1.829	.03	.05	.233	ID[d]	ID[d]	ID[d]	.00	.09	2.717**
Spanish as a Second Language	.20	.32	3.498***	.05	.06	.519	.03	.04	.150	.26	.23	-1.090	.18	.16	-.530	.09	.15	3.267***
Prueba de Lectura	.17	.14	-.655	.06	.07	.565	.10	.13	.992	-.07	-.05	.213	.04	-.02	-.759	.06	.08	.859
Attitude Toward Spanish	.07	.12	1.382	.17	.17	.143	.19	.22	.832	.06	.11	1.472	-.02	.05	1.427	.13	.16	1.697
Attitude Toward English	-.04	-.04	-.161	.00	.01	.322	.00	.06	1.919	.07	.08	.335	.00	.10	2.354*	.00	.03	1.421
Attitude Toward School	.04	.04	.116	-.02	.00	.638	.05	.04	-.326	.03	.10	1.759	-.06	.07	2.483*	.02	.04	1.208

---

[a] The effects of SES, number of days between testing, Factor Score 1, LESA Factor Score 2, and the product of the factors have been partialed out.

[b] Only students with both fall and spring scores are used in this analysis.

[c] The t-test is for differential treatment gains indicated by increased correlations. A positive t indicates that gains were greater in the Title VII group.

[d] Insufficient data.

* = $p < .05$
** = $p < .01$
*** = $p < .002$
**** = $p < .0001$

overall program impact on the Reading Total Score was significantly negative, these effects were not significant for the Reading Total (Rescored). Overall effects on Mathematics Computation and Mathematics Total were significantly positive. Corroborating a finding mentioned earlier in a discussion of the effects of prior experience in bilingual education--that the correlation of ESL scores with number of prior years of experience in bilingual education classes for Title VII students rose steadily across grade levels to .65 for the sixth grade--overall Program impact on ESL scores (in terms of fall-to-spring gains) was significantly positive.

It must be noted, however, that the only students included in these analyses were those who were designated by their teachers to be monolingual Spanish for test-taking purposes because only such students were given the ESL test. The numbers of Title VII Hispanic students in these analyses were small (ranging from 53 students in grade six to 243 students in grade two) and the numbers of Non-Title VII Hispanic students were very small (ranging from 0 students in grade six to 16 students in grade two). Thus, the generalizability of this finding is highly questionable and no Program impact conclusion is really appropropriate.

Title VII Program impact on Attitude Toward Spanish was significantly positive as well. Effects on Spanish Language Arts measures and on the other attitude measures, on the other hand, did not show consistent overall effects.

Many of the significant results of the comparisons between Title VII With Comparison classrooms and Non-Title VII classrooms were also observed in the analyses in which the performance of the Title VII Without Comparison group was included in the comparisons with the Non-Title group (see Table II-B-23). This was to be expected because comparisons were still relative to the same Non-Title VII treatment classrooms. The differences in significant findings when comparisons involved Title VII Pooled classrooms rather than only Title VII With Comparison classrooms were that for the Title VII Pooled analyses (1) overall aggregated Program impact on the Reading Total (Rescored) measure was significantly negative,

(2) overall aggregated Program impact on the SSL was significantly positive, and (3) overall aggregated Program impact on Attitude Toward Spanish was not significant, and (4) at some grade levels, there were differences in statistical significance with respect to some outcomes. Most notable of the differences for particular grades were that relative to the Title VII With Comparison versus Non-Title VII analyses in the Title VII Pooled analyses, there (1) were significant negative Program effects on Reading Total Scores in grade 6, (2) were positive Program effects on Mathematics scores in grades 4 and 5 rather than in 2 and 5, and (3) was no statistically significant positive impact in grade 4 with respect to ESL gains.

Analysis of covariance. The results of the analyses of covariance, in which spring test score group means were compared after they had been adjusted for group differences on the fall test (i.e., the pretest), SES, number of days between testings, and the language use factor score indices and their interaction, are shown in the Tables II-B-6a through II-B-58a in Appendix II-B, for 11 measures in 5 grades. There were insufficient data for comparisons in Spanish Reading and in ESL scores for the sixth grade. In each table are shown tests of homogeneity of regression slopes and tests of whether the two Title VII groups had sufficiently similar intercepts to allow pooling, where appropriate. Tests of Title VII versus Non-Title VII impact are present in each table as well. Unlike the procedures described for the fall-to-fall analyses, however, it was decided that it would not be feasible to implement analyses of transformed scores when heterogeneity of regression was significant simply because of the large number of analyses involved. Our approach in the present analyses was to evaluate the magnitude of the heterogeneity of regression rather than its statistical significance. We used a rule that does not strictly conform to rigorous statistical theory, but which, we believe, did allow us to infer essentially accurate estimates of positive and negative effects of Title VII treatment. These results are most useful when viewed as corroborating the results of other impact analyses.

The criteria applied to decide whether the results of ANCOVA analyses were appropriate were that (1) the differences in adjusted group posttest means (or intercepts) be significant at the .05 level, (2) the amount of posttest variance accounted for by the difference in means (1 degree of freedom) be at least as large as the amount of variance accounted for by the deviation from homogeneity of within-group regression (6 to 13 degrees of freedom, depending upon the particular analysis), and (3), less than 1% of the posttest variance was accounted for by the deviations from homogeneity. With these constraints, 18 significant differences were identified involving comparisons between Title VII With Comparison classrooms and Non-Title VII classrooms, 9 involving comparisons between Title VII Without Comparisons classrooms and Non-Title VII classrooms, and 2 involving comparisons between Title VII Pooled classrooms and Non-Title VII classrooms.

Based on comparisons of Title VII With Comparison classrooms and Non-Title VII classrooms, the statistically significant differences on allowable tests were (1) at the fourth-grade level Title VII was *more* effective than Non-Title VII for improving English Reading (as measured by the CTBS), (2) Title VII was *less* effective than Non-Title VII for improving English Reading in grades 2 and 3 and not significantly different from Non-Title VII in grades 5 and 6, (3) Title VII was *more* effective than Non-Title VII with respect to Mathematics Computation in grades 2 and 5, (4) Title VII was *more* effective than Non-Title VII with respect to the skills measured by the SSL test in grades 3 and 4, and (5) Title VII was *more* effective than Non-Title VII in improving Attitude Toward School of second- and fifth-graders and Attitude Toward Spanish in all grades but sixth. Many of the comparisons not listed here as significant were not allowable because they violated the assumptions underlying the statistical technique, but would have been significant if allowable. There were no instances of allowable significant differences between the Title VII Pooled/Non-Title VII analyses and the Title VII With Comparison/Non-Title VII analyses.

Comparisons with norms. Norms were available only for the CTBS Reading and Mathematics tests. Percentile ranks corresponding to mean expanded standard scores are shown in Tables II-B-21 through II-B-25, for grades 2 through 6, respectively. The average time of testing dates are also shown. However, their usefulness in making corrections to norm-referenced

TABLE II-B-21

Percentile Ranks for Average CTBS Expanded Standard Scores and Average Time of Testing for Non-Title VII and Title VII Hispanic Students--Fall 1975 to Spring 1976 Analyses, Grade 2

				Non-Title VII		Title VII					
						Title VII With Comparison		Title VII Without Comparison		Title VII Pooled	
CTBS Score	Form/ Level	Time of Testing of Norm Sample	Time of School Year	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank
Reading Total	S/C	Early October	Fall 75	4.75	18.14	4.54	16.94	4.31	16.91	4.40	16.92
	S/C	Early April	Spring 76	10.14	26.40	10.08	17.34	9.74	22.23	9.87	19.88
Reading Total Rescored	S/C	Early October	Fall 75	4.79	14.32	4.49	9.86	4.34	13.50	4.40	11.96
	S/C	Early April	Spring 76	10.17	24.06	10.18	15.22	9.79	18.44	9.95	17.25
Reading Vocabulary	S/C	Early October	Fall 75	4.79	19.34	4.49	18.22	4.34	18.19	4.40	18.20
	S/C	Early April	Spring 76	10.17	24.47	10.18	16.34	9.78	18.66	9.95	17.72
Mathematics Computation	S/C	Early October	Fall 75	4.80	29.92	4.49	25.62	4.33	26.97	4.40	26.42
	S/C	Early April	Spring 76	10.19	37.89	10.16	43.20	9.76	38.64	9.93	40.51
Mathematics Total	S/C	Early October	Fall 75	4.76	22.38	4.49	24.01	4.34	22.99	4.40	23.41
	S/C	Early April	Spring 76	10.16	33.18	10.16	36.30	9.76	34.29	9.93	34.94

TABLE II-B-22

Percentile Ranks for Average CTBS Expanded Standard Scores and Average Time of Testing for Non-Title VII and Title VII Hispanic Students--Fall 1975 to Spring 1976 Analyses, Grade 3

				Non-Title VII		Title VII					
						Title VII With Comparison		Title VII Without Comparison		Title VII Pooled	
CTBS Score	Form / Level	Time of Testing of Norm Sample	Time of School Year	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank
Reading Total	S/1	Early October	Fall 75	4.59	21.69	4.42	21.49	4.43	14.93	4.42	19.42
	T/1	Early April	Spring 76	10.06	23.10	9.98	19.04	10.35	13.72	10.10	16.88
Reading Total Rescored	S/1	Early October	Fall 75	4.61	21.11	4.42	21.06	4.46	12.40	4.43	18.12
	T/1	Early April	Spring 76	10.07	22.51	9.99	18.58	10.35	12.29	10.11	16.27
Reading Vocabulary	S/1	Early October	Fall 75	4.60	21.22	4.42	21.17	4.47	15.04	4.44	19.00
	T/1	Early April	Spring 76	10.08	21.28	9.99	18.33	10.35	14.17	10.12	16.83
Mathematics Computation	S/1	Early October	Fall 75	4.60	30.29	4.42	30.71	4.50	23.44	4.45	27.98
	S/1	Early April	Spring 76	10.12	35.95	9.98	38.15	10.38	33.68	10.12	36.47
Mathematics Total	S/1	Early October	Fall 75	4.59	23.83	4.43	25.86	4.44	19.35	4.43	23.89
	S/1	Early April	Spring 76	10.10	27.04	9.96	30.63	10.38	27.08	10.10	29.64

TABLE II-B-23

Percentile Ranks for Average CTBS Expanded Standard Scores and Average Time of Testing for Non-Title VII and Title VII Hispanic Students--Fall 1975 to Spring 1976 Analyses, Grade 4

				Non-Title VII		Title VII					
						Title VII With Comparison		Title VII Without Comparison		Title VII Pooled	
CTBS Score	Form/ Level	Time of Testing of Norm Sample	Time of School Year	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank
Reading Total	S/1 T/1	Early October Early April	Fall 75 Spring 76	4.59 10.06	19.99 17.16	4.53 10.08	15.97 18.71	4.40 10.08	22.32 21.00	4.47 10.08	19.04 19.41
Reading Total Rescored	S/1 T/1	Early October Early April	Fall 75 Spring 76	4.60 10.06	19.64 16.80	4.53 10.08	15.78 17.55	4.41 10.08	21.65 21.00	4.47 10.08	18.73 18.99
Reading Vocabulary	S/1 T/1	Early October Early April	Fall 75 Spring 76	4.60 10.07	18.96 15.90	4.53 10.08	15.73 17.54	4.41 10.08	22.02 21.21	4.47 10.08	18.36 19.03
Mathematics Computation	S/1 S/1	Early October Early April	Fall 75 Spring 76	4.63 10.11	34.72 42.01	4.53 10.07	39.30 46.01	4.41 10.07	39.80 48.77	4.47 10.07	39.55 47.33
Mathematics Total	S/1 S/1	Early October Early April	Fall 75 Spring 76	4.61 10.09	27.29 31.07	4.53 10.07	30.78 35.20	4.39 10.10	34.10 41.83	4.47 10.09	32.65 38.22

TABLE II-B-24

Percentile Ranks for Average CTBS Expanded Standard Scores and Average Time of Testing for Non-Title VII and Title VII Hispanic Students--Fall 1975 to Spring 1976 Analyses, Grade 5

				Non-Title VII		Title VII					
						Title VII With Comparison		Title VII Without Comparison		Title VII Pooled	
CTBS Score	Form/ Level	Time of Testing of Norm Sample	Time of School Year	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank
Reading Total	S/2	Early October	Fall 75	4.81	22.15	4.55	23.62	4.48	15.04	4.49	15.94
	T/2	Early April	Spring 76	10.03	26.54	10.21	26.31	9.83	17.02	9.90	17.97
Reading Total Rescored	S/2	Early October	Fall 75	4.81	22.15	4.55	22.38	4.49	14.39	4.50	15.50
	T/2	Early April	Spring 76	10.03	26.54	10.22	25.67	9.84	16.31	9.91	17.61
Reading Vocabulary	S/2	Early October	Fall 75	4.81	21.54	4.55	20.57	4.48	15.42	4.50	16.30
	T/2	Early April	Spring 76	10.03	16.60	10.22	21.17	9.84	11.90	9.91	13.09
Mathematics Computation	S/2	Early October	Fall 75	4.81	38.97	4.55	34.63	4.47	28.93	4.49	29.59
	S/2	Early April	Spring 76	10.03	33.51	10.26	43.32	9.81	29.58	9.89	31.84
Mathematics Total	S/2	Early October	Fall 75	4.79	31.90	4.56	35.22	4.45	24.66	4.47	26.38
	S/2	Early April	Spring 76	10.01	26.45	10.24	39.31	9.76	23.84	9.84	26.44

TABLE II-B-25

Percentile Ranks for Average CTBS Expanded Standard Scores and Average Time of Testing for Non-Title VII and Title VII Hispanic Students--Fall 1975 to Spring 1976 Analyses, Grade 6

				Non-Title VII		Title VII					
						Title VII With Comparison		Title VII Without Comparison		Title VII Pooled	
CTBS Score	Form / Level	Time of Testing of Norm Sample	Time of School Year	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank	Average Time of Testing	Percentile Rank
Reading Total	S/2	Early October	Fall 75	4.89	20.76	4.46	18.59	4.54	14.10	4.53	14.52
	T/2	Early April	Spring 76	9.93	25.02	10.20	17.97	9.78	15.01	9.83	15.36
Reading Total Rescored	S/2	Early October	Fall 75	4.89	20.76	4.46	17.42	4.54	14.10	4.53	14.39
	T/2	Early April	Spring 76	9.93	25.02	10.21	17.52	9.78	15.01	9.84	15.31
Reading Vocabulary	S/2	Early October	Fall 75	4.91	21.55	4.46	16.91	4.56	16.78	4.54	16.80
	T/2	Early April	Spring 76	9.94	14.70	10.21	15.91	9.75	12.24	9.80	12.83
Mathematics Computation	S/2	Early October	Fall 75	4.89	34.47	4.46	35.41	4.56	34.00	4.54	34.18
	S/2	Early April	Spring 76	9.94	31.50	10.23	33.76	9.80	37.15	9.85	36.78
Mathematics Total	S/2	Early October	Fall 75	4.80	29.92	4.46	27.32	4.55	26.85	4.54	26.91
	S/2	Early April	Spring 76	9.86	29.35	10.22	29.06	9.79	31.68	9.85	31.21

analyses such as these is questionable because of the lack of positive relationship found between time of testing and test scores.

Gains in percentile ranks can be interpreted either at face value or through comparisons between groups. The results of comparisons between groups are similar to those presented in the standardized residual gain score and ANCOVA analyses. The positive impact of the Program on English Reading in the fourth grade, a result demonstrated in earlier analyses, corresponds to an overall differential gain of about 4 to 5 percentile ranks. The gains in Mathematics in the fifth grade that can be associated with Title VII membership amount to about 10 percentile ranks.

Direct interpretation of fall-to-spring gains in percentile ranks must be cautious because fall norms for the CTBS were not empirically developed. Rather, the test publisher derived fall norms by interpolating from standardization data gathered from different grades in the spring of the year. Examination of our data suggested that CTBS Mathematics Total gains, as well as CTBS Reading Total gains in grades 2, 5, and 6, may be slightly overestimated by the data in Tables II-B-21 through II-B-25. Thus, only substantial gains or losses are likely to be valid, given the variety of distortions that could arise in using CTBS national norms to evaluate the gains observed in this Study. Using the conservative criterion that gains and losses must be greater than 10 percentile ranks to be considered substantial, we found no substantial losses for the Title VII groups. The only substantial gains for Title VII were on Mathematics tests in grade 2 (for all three treatment groups) and grade 3 (for Title VII With Comparisons).

Summary of the in-depth analyses of Title VII impact on Hispanic students. Title VII impact on cognitive skills in English Language Arts, Spanish Language Arts, and Mathematics and on student attitudes toward school, English, and Spanish was evaluated by means of a number of different analytic techniques. Students in the various samples analyzed were Hispanic students enrolled in a nationally representative sample of second-through-sixth-grade classrooms that were present in projects which were in their fourth or fifth year of Title VII funding as of the 1975-76 school year. The basic evaluation hypothesis tested was whether or not

Title VII student growth in achievement and changes in attitude occurring between fall 1975 and spring 1976 could be attributed to Title VII Program impact.

Findings derived from the in-depth impact analyses implemented are presented in the remainder of this section. Also discussed (where appropriate) are the findings and implications of a number of analyses that examined various methodological issues which potentially could have affected the Study's conclusions regarding Program impact.

In general, the results of the three methods of Title VII impact analysis were supportive of each other. The differences that did occur were in magnitude, rather than in direction. Convergence of findings across analytic methods, then, lends credibility to the results, in that they are not likely to be due to artifacts of a single statistical method or comparative approach. This is not to say, however, that potential artifacts arising from other sources, such as the limitation of types of communities in which comparison classrooms were available, were not affecting the results. What was found was that for Title VII With Comparison classrooms, Title VII had (1) positive effects on English Reading gains only in the fourth grade and had negative effects in the second and third grades and was not different from Non-Title VII impact in the fifth and sixth grades and (2) positive impact on Mathematics gains, but only in the fifth and possibly second grades. When the findings from the various grade levels were aggregated together, Title VII had positive overall impact on Mathematics skills, on Student Attitude Toward Spanish, and on English as a Second Language (for the very small numbers of students who had been given such tests because their teachers had designated them Spanish monolingual for test-taking purposes). Overall findings across grade levels for English Reading showed that gains for Non-Title VII Hispanic students were greater than those for Title VII Hispanic students on one of the measures of English Reading.

The conclusions of these analyses can be generalized to the whole of Title VII to the extent that it can be assumed that Title VII was having the same impact in Title VII Without Comparison communities (relative to Non-Title VII/Comparison classrooms in those sites if they would have been available) as it was having in Title VII With Comparison communities. Although this assumption was untestable (because, by definition, there were no Non-Title VII classrooms in Title VII Without Comparison communities), we could compile no compelling evidence that it was not true. Title VII With Comparison classrooms and Non-Title VII classrooms were indeed different from Title VII Without Comparison classrooms in that (1) the former were located in the Southwest and served Mexican-American Hispanic students and (2) the latter were located in the Northeast and served Puerto Rican-American Hispanic students. In spite of these regional and Hispanic background differences, however, results based on analyses that included data from students in Title VII Without Comparison classrooms, in most cases, paralleled the findings summarized above. In any event, none of the differences between analyses containing students from Title VII Without Comparison classrooms contradicted those based on Title VII With Comparison/Non-Title VII students alone. (The only possible notable difference was that in the comparative analyses involving sixth-grade Title VII Pooled classrooms, the gains of Non-Title VII students surpassed those of Title VII Pooled students in the Reading Total and Reading Total [Rescored] analyses).

Thus, the Impact Study's findings regarding Title VII Program impact appeared to be quite stable across impact analysis methods and across different group comparisons (i.e., community types). However, are any of these conclusions subject to question because of such methodological issues as attrition effects, test-omission effects, differential guessing effects and out-of-level testing effects? It is, of course, only an approximation to try to aggregate the implications of all the findings derived in the analyses of these methodological issues because the interactive influences of such issues were not analyzed (e.g., it is impossible to measure guessing rates of individuals not present for testing). Also, most of the methodological analyses pertained only to the CTBS tests, so little can be said about the other tests and measures. In order to obtain a rough estimate of the effect of the distortions on the results listed earlier in this summary, we added together the rough "correction" estimates for each and compared them to the estimates of residual posttest mean differences between Title VII With Comparison classrooms and Non-Title VII classrooms shown in the ANCOVA tables (II-B-6a through II-B-58a in Appendix II-B). The only case in which the summed correlations reduced a significant difference to less than one-half its reported size was for the Mathematics gains in fifth grade. The attrition and test-omission corrections each would reduce the positive Title VII impact by nine Mathematics Expanded Standard Score points, which would reduce the adjusted posttest mean difference from 22 points to 4. Because the procedures used to estimate attrition and missing data effects probably overestimated their impact, the most reasonable conclusions regarding Program impact on Mathematics during grade five, then, is that Title VII may have had positive effects on such gains.

The pattern of grade-specific gains summarized above at first appears perplexing and might possibly suggest to the reader a lack of stability in the data collected. However, there is no reason to believe that substantially different data collection practices were implemented for different grades. Also, differences in gains among grades were highly significant. In particular, there seems little doubt that the gains in English Reading scores were positively correlated with Title VII participation during the fourth grade but were negatively correlated with it in the second and third grades. There was also evidence of no differential impact of Title VII in the fifth grade and possibly negative impact in the sixth grade in Title VII Without Comparisons. To help explain this result, we looked for differences in the processes to which students in different grades were exposed. As might be expected, processes were occurring in the fourth grade that are logically related to English Reading gains. First, relative to Title VII classrooms in the other grades, in fourth grade Title VII classrooms more time was being allocated to English Language Arts and less time was being allocated to Spanish Language Arts (see Table II-B-26). Second, fourth-grade Title VII teachers reported non-classroom use of English was greater than that of Title VII teachers in the other grades while their non-classroom use of Spanish was less than that of Title VII teachers in other grades. Although the trends among grades shown in Table II-B-26 are not dramatic, they are systematic and, for this reason, suggest the speculation that in the fourth grade, more than in other grades, Title VII teachers were emphasizing the acquisition of English Language Arts skills in their classrooms and were themselves more English dominant.

It is necessary to establish values for gains in different areas--English Reading, Mathematics, Attitudes, and the understanding of spoken English--in order to decide whether the Program is, in fact, accomplishing its goals. Certainly the mean percentile rank standings on English Reading (in the 15th to 20th percentile range) and, to a less extent, on Mathematics (in the 25th to 35th percentile range) do indicate that the students in the Title VII classrooms in this Study still have substantial educational needs.

The conclusions we have been able to draw from these analyses suggest that at least on an overall across-grades basis, Title VII does not appear to be having a significant impact in meeting its goals as set forth in the legislation. Positive impact occurred on some dimensions in some grades. However, in a number of situations where positive impact was expected, it did not occur. For example, evidence presented in this section shows that gains in English Reading were greatest in Non-Title VII classrooms in grades 2 and 3, greatest in Title VII classrooms in grade 4, and no different in Title VII and Non-Title VII classrooms in grades 5 and 6. Proponents of bilingual education would argue that such trends in English Reading gains during the second, third, and fourth grades support the contention that presence in a bilingual education classroom may not have an immediate positive effect on English Reading (as in grades 2 and 3), but that eventually it will (as in grade 4). Because this Study was not designed as a longitudinal study in which achievement is related to long-term exposure to Title VII, such an inference must remain a speculation, at best. But, if it is not a mere speculation, reasons for the finding regarding the lack of continued improved performance in English Reading in grades 5 and 6 need to be developed.

Other Issues

Reliability and validity of teacher judgments. Because teachers supplied information on the characteristics and backgrounds of each of their students and because such data were used in the descriptive and inferential statistical procedures implemented by the Impact Study, one very natural question that needed to be addressed was the extent to which teachers could supply reliable and valid information on students. To this end, reliabilities were estimated by computing correlations between fall and spring responses to the same item, and validities were estimated by computing correlations of judgmental items with variables to which they were related on a priori grounds.

Fall-to-spring correlations, of course, will yield an underestimate of the reliability of a given attribute because it is possible that the "true" attribute or characteristic being measured has changed across time. Thus, the correlations between fall and spring teacher responses shown in Table II-B-27 must take this limitation into account.

Kendall's tau (τ) was used as the measure of correlation/association in these analyses (see Siegel, 1956). This statistic, although an ordinal correlation coefficient, will equal (1) 1.0 if all fall-to-spring responses fall along the major diagonal, (2) -1.0 if all cases fall along the minor diagonal, and (3) 0.0 if the number of off diagonal gains equals the number of gains on the major diagonal. "τ" is a sort of coefficient of disarray (Siegel, 1956, p.215). Also shown in Table II-B-27 is the percentage of "same" fall-to-spring responses.

Examination of the findings shows that teacher judgments of students' dominant spoken language in the fall are highly related to similar but independently made judgments in the spring. The presumed reason is that teachers are, indeed, reliable judges of these attributes. Numbers of Years of Prior Exposure to Bilingual Education Classes is somewhat less stable between fall and spring; and, the reported "Reasons for Being In the Bilingual Program" is even less stable. Because of its moderate correlation and because fall-to-spring judgments could be expected to change for Title VII students (note the moderately high τ and fairly low percentage of same responses), the Number of Years of Prior Exposure to Bilingual Education Classes can, for all practical purposes, be considered fairly reliable.

The item describing Reasons for Being in the Bilingual Program is somewhat less reliable. However, fall-to-spring responses by teachers were the same for almost 70% of the students. Given this result

TABLE II-B-26

General Teacher Use of English and Spanish and Instructional Time Devoted to English and Spanish in Title VII Classrooms, by Grade[a]

Language Use	Grade				
	2	3	4	5	6
Teacher's Non-Classroom Use of English[b]	3.24	3.20	4.18	3.56	3.63
Teacher's Non-Classroom Use of Spanish[b]	2.79	2.80	2.13	2.59	2.72
Weekly Hours Per Student in English Language Arts Instruction	7.81	8.33	8.54	7.50	6.46
Weekly Hours Per Student in Spanish Language Arts Instruction	4.95	5.46	3.98	4.06	6.02

[a] Table entries are mean characteristics for students in the Intensive Sample who were present during both fall 1975 and spring 1976.

[b] This scale is discussed in Chapter III.

and given the fact that the fall and spring marginal distributions for this item were almost identical, it is reasonable to assert that the Impact Study's conclusions based on these items are valid.

As shown in Table II-b-27, fall/spring teacher responses on the items contained in the Study SES scale were stable and, therefore, (presumably) reliable.

The validity of teacher judgments of linguistic abilities can be estimated from their correlations both with student self-assessments and with English and Spanish test scores. In both cases, however, low correlations would not necessarily imply that teachers' assessments were invalid: it might be the other measures which are invalid, or it might be that different dimensions of equal importance were being assessed. The correlation between the teacher's judgment of the child's dominant language and the child's estimate of the language he/she spoke best was .46. Thus, although there was agreement, it was not nearly perfect. We tend to accept the validity of the teachers' estimates relative to the children's self-estimates primarily because it was the teachers' estimates that had the highest loading of any variable on the English Preference factor. The validity of teacher judgments of language for testing purposes is shown in the variation in English Reading scores and oral Spanish Reading scores between the groups assigned different test packets, displayed in Table II-B-28. All F ratios were highly significant, as packet assignment accounted for between 10% and 33% of test score variance. Those students classified English-monolingual or English-dominant bilingual scored about the same on the CTBS Reading test, and the other groups scored lower; but on the Spanish oral language test, those whom teachers judged to be English monolingual scored lower than the bilingual students. (The Spanish oral language test [SSL] was not given to those judged to be Spanish monolingual.)

Prior bilingual education experience. Because the Impact Study was designed to evaluate Title VII impact during the fall-to-spring interval of the 1975-76 school year, there was no way of directly estimating the impact that participation in bilingual education in prior years may have had. Presumably, the effects of all previous educational experiences would be reflected in each student's fall 1975 pretest score. If this were indeed true, then, use of the pretest as a covariate would allow the

TABLE II-B-27

Measurements of Agreement Between Fall and Spring Teacher Judgments

	TITLE VII		NON-TITLE VII	
Linguistic Information	τ	% same responses	τ	% same responses
"This child is a (1) monolingual Spanish speaker, (2) bilingual English and Spanish speaker, (3) monolingual English speaker." (bilingual with other languages could be included in the monolingual categories.)	.79	87.7	.88	92.7
"This child's dominant language is (English, Spanish, other)."	.74	88.3	.73	85.8
Bilingual Program Information				
"This child has been involved in bilingual education classes for (1 year or less, 2,3,4,5 years, 6 years or more)."	.66	51.2	not computed insufficient data	
"This child was admitted to the bilingual program primarily because of: (Spanish surname, need for English instruction, parent request, bilingualism, other)."	.43	69.7	not applicable	
SES Components				
"What is the probable level of education of the child's mother (or female head of household)?"	.74	79.8	.68	78.2
"What kind of work does the child's father (or male head of household) do?"	.66	68.7	.60	63.6
"What is the probable level of education of the child's father (or male head of household)?"	.77	80.6	.72	78.4
"What kind of work does the child's mother (or female head of household) do?"	.75	73.3	.72	71.8

Note: τ is an ordinal correlation coefficient, and the percentage refer to the number of children for whom the same judgment was made in fall and spring. Data are based on all students in the Impact Study Data Base for whom there were fall and spring data on the measures.

TABLE II-B-28

Mean Fall English Reading and Oral Spanish Language Scores for Students Judged to Have Different Linguistic Abilities by their Teachers

CTBS Reading Total Score

Group	Grade				
	2	3	4	5	6
Monolingual English	261	311	351	382	416
Bilingual English Dominant	267	312	351	370	393
Bilingual Spanish Dominant	241	293	326	348	369
Monolingual Spanish	218	239	259	277	280
F	71	168	184	125	115
η^2	.12	.18	.19	.21	.30

Spanish as a Second Language Test Score

Group	Grade				
	2	3	4	5	6
Monolingual English	49	46	52	52	48
Bilingual English Dominant	63	59	63	64	66
Bilingual Spanish Dominant	63	59	63	66	68
F	140	112	117	93	177
η^2	.20	.10	.10	.13	.33

Study to control for prior treatment effects. The nature of bilingual education is sufficiently unique, however, that prior exposure to bilingual education classes may, in fact, determine the effectiveness of a Title VII treatment in the 1975-76 school year. Since substantial numbers of Hispanic students had had some exposure to bilingual education in prior years, exploratory analyses were undertaken to ascertain what effects such exposure may have had.

Each student's number of years of prior bilingual education was assessed through teacher estimates. Unfortunately, the question was worded in a way such as to be appropriate for Title VII teachers. Thus, its interpretation by Non-Title VII teachers was ambiguous and a large number left it blank. Therefore, our analyses were limited to the Title VII group. The mean levels of number of years of prior bilingual experience and its correlations with pretest scores are shown in Table II-B-29. The mean level of years of experience should be interpreted cautiously because the value one (1) represents the response "1 year or less," while other values represent the number of years.

The most notable finding displayed in Table II-B-29 is the substantial and steadily increasing correlation of years of prior bilingual education with ESL test scores. Although there are also significant correlations with Reading and Vocabulary scores in grades 4, 5, and 6, it appears that, of the measures used in this study, the ESL test was the most sensitive to the outcomes of prior years of bilingual instruction in that it was most highly correlated with number of years. It must be remembered, however, that few Title VII students were judged by their teachers as having to take an ESL test rather than a grade level English Reading test, specified at grades 4, 5, and 6. The mean ESL pretest and posttest scores for Hispanic Title VII students are shown in Tables II-B-30 and II-B-31, for each grade level and number of years of prior bilingual education experience.

The importance of years of Prior Bilingual Education Experience as a modifier of Title VII Program impact during fall-to-spring of the 1975-76 school year was analyzed by means of multiple regression analysis. A regression model was created that included as predictors of postest (1) pretest, (2) Years of Prior Bilingual Education Experience, and (3) the pretest/"Years..." interaction. The proportion of posttest variance

TABLE II-B-29

Years of Prior Bilingual Education Experience and Their Relations to Fall 1975 Pretest Scores, for Hispanic Title VII Students

Group	GRADE 2	3	4	5	6
	Mean Number of Years				
Title VII With Comparison	2.02	2.34	2.72	3.24	2.59
Title VII Without Comparison	2.00	2.33	2.79	3.03	3.25
	Correlations with Test Scores				
Reading Total	.09	.00	.16	.14	.15
Reading Total Rescored	.04	.02	.16	.15	.15
Vocabulary	.08	.03	.17	.15	.20
Prueba de Lectura	.01	-.19	-.23	.06	.06
English as a Second Language	.15	.24	.38	.42	.65
Spanish as a Second Language	.08	.07	.05	.17	.22
Mathematics Computation	-.04	.00	.04	.08	-.01
Mathematics Total	-.02	.03	.05	.08	.01
Attitude Toward School	.14	-.06	.00	.04	-.05
Attitude Toward English	.08	.04	.08	.07	.12
Attitude Toward Spanish	.06	.01	.03	.09	-.24

TABLE II-B-30

Mean ESL Scores in Fall 1975 for Hispanic Title VII Participants by Grade and Number of Years of Prior Bilingual Education

Years in Bilingual Education		GRADE 2	3	4	5	6	ROW TOTAL
1 YEAR OR LESS	Mean	549.85	551.67	555.39	556.85	557.31	553.39
	N	46	55	38	34	16	189
	SD	12.40	13.33	12.45	11.34	12.83	12.74
2 YEARS	Mean	558.77	554.04	559.35	565.55	569.56	559.30
	N	119	54	26	29	16	244
	SD	10.49	13.20	12.57	11.15	7.97	11.98
3 YEARS	Mean	559.23	562.02	564.53	567.79	574.00	561.85
	N	66	44	15	19	1	145
	SD	9.97	10.66	12.94	10.79	0.0	10.91
4 YEARS	Mean	547.11	558.45	576.00	577.00	582.00	563.12
	N	9	11	1	5	6	32
	SD	14.28	14.00	0.0	5.79	2.53	17.57
5 YEARS	Mean	0.0	533.00	573.33	568.17	0.0	566.20
	N	0	1	3	6	0	10
	SD	0.0	0.0	6.03	24.68	0.0	22.10
COLUMN TOTAL		556.75	555.55	559.18	563.61	566.56	558.40
		240	165	83	93	39	620
		11.55	13.31	13.03	13.18	13.03	12.99

TABLE II-B-31
Mean ESL Scores in Spring 1976 for Hispanic Title VII Participants by Grade and Number of Years of Prior Bilingual Education

Years in Bilingual Education		GRADE 2	3	4	5	6	ROW TOTAL
1 YEAR OR LESS	Mean	561.67	566.96	568.08	564.12	566.12	565.32
	N	46	55	38	34	16	189
	SD	10.02	9.54	8.22	11.84	10.55	10.13
2 YEARS	Mean	565.81	568.04	569.19	571.59	577.00	568.09
	N	119	54	26	29	16	244
	SD	8.18	7.16	6.24	12.50	4.77	8.73
3 YEARS	Mean	565.08	572.18	572.27	573.53	578.00	569.17
	N	66	44	15	19	1	145
	SD	6.89	4.65	6.55	7.74	0.0	7.36
4 YEARS	Mean	558.56	570.09	576.00	579.20	584.67	571.19
	N	9	11	1	5	6	32
	SD	11.77	7.98	0.0	3.57	1.67	12.31
5 YEARS	Mean	0.0	565.00	575.33	579.00	0.0	576.50
	N	0	1	3	6	0	10
	SD	0.0	0.0	6.43	5.80	0.0	6.88
COLUMN TOTAL		564.55	568.90	569.54	570.14	573.74	567.79
		240	165	83	93	39	620
		8.55	7.77	7.39	11.73	10.08	9.27

accounted for by the model was then compared with that accounted for by a given regression model that did not include the interaction predictor variable. The results are shown in Table II-B-59a through II-b-63a in Appendix II-B.

In grades 2, 3, and 4, in no case did the years of prior experience add as much as 1% to the posttest variance accounted for. In grade 5, there was a contribution of 4% to the variance in ESL scores, 2% to the SSL scores, and 1% to the Reading Total scores; and in grade 6 there was a contribution of over 1% to the variance only in Prueba de Lectura, ESL, Mathematics Computation, and Attitude Toward Spanish scores. In grades 5 and 6 (except for the Prueba de Lectura whose extremely low pretest/posttest correlation casts doubt on its usefulness) the pattern of standardized regression coefficients suggested that for individuals with a great deal of prior bilingual education experience, fall and spring ESL scores were not as strongly related as they were for individuals with less prior experience.

Thus, prior exposure to bilingual education tended, for fifth and sixth grades, to decrease the relationship between some pretest and posttest measures of Program impact. The exact implications of these findings are not clear because time constraints, as well as the design of the Impact Study, did not permit a more intensive examination of trends in these data. However, the exploratory analyses which were performed showed that years of prior experience in bilingual education accounted for typically no more than 1% of the variance in any of the student outcome measures in English, Mathematics, Spanish, and Attitudes.

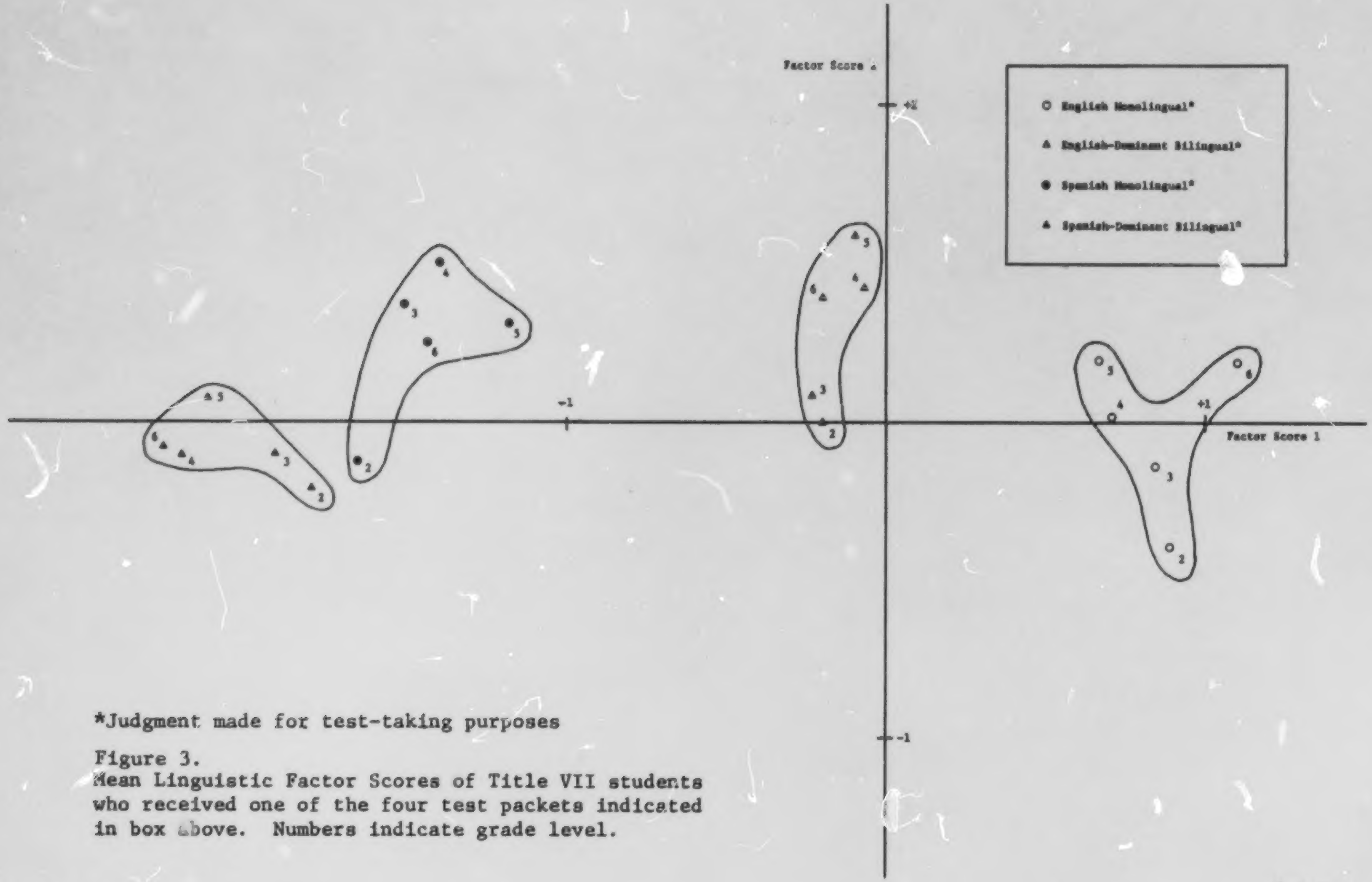
Packet assignment validity. In Volume I, statements were made concerning the proportions of students in Title VII who took one of four test packets based on teacher judgment related to appropriate language for test-taking purposes. Because reviewers of the report questioned the validity of those teacher judgments, packet assignments were compared to the two derived language preference factors discussed previously in this volume. If the teacher packet assignments were valid, then the students assigned the English monolingual packet should have been high on the English Preference factor and low on the Bilinguality factor, English-dominant bilingual packet students should have been relatively high on both factors, Spanish-dominant bilingual packet students should have been low on the English Preference factor but high on the Bilinguality factor, and the Spanish monolingual packet students should have been relatively low on both factors.

The results of this comparison are shown in Figures 3, 4, and 5 for Title VII, Non-Title VII, and combined groups for each of grades 2 through 6. The separation of factor scores between packet-assignment groups, in the predicted directions, is striking. For all grades and both treatment groups, the F-ratios for the English Preference factor were highly significant, with packet assignment accounting for about 50% of the variance in that factor in Title VII classrooms and 20% of the variance in Non-Title VII classrooms. For the Bilinguality factor, the F-ratios were also highly significant for Title VII students; however, packet assignment generally accounted for less than 5% of the variance, and only a few of the Bilinguality factor F-ratios for Non-Title VII students were significant.

The findings depicted in Figures 3, 4, and 5, suggest that teacher judgments were sufficiently valid to support the statements made in Volume I concerning the proportion of Title VII students who were English dominant.

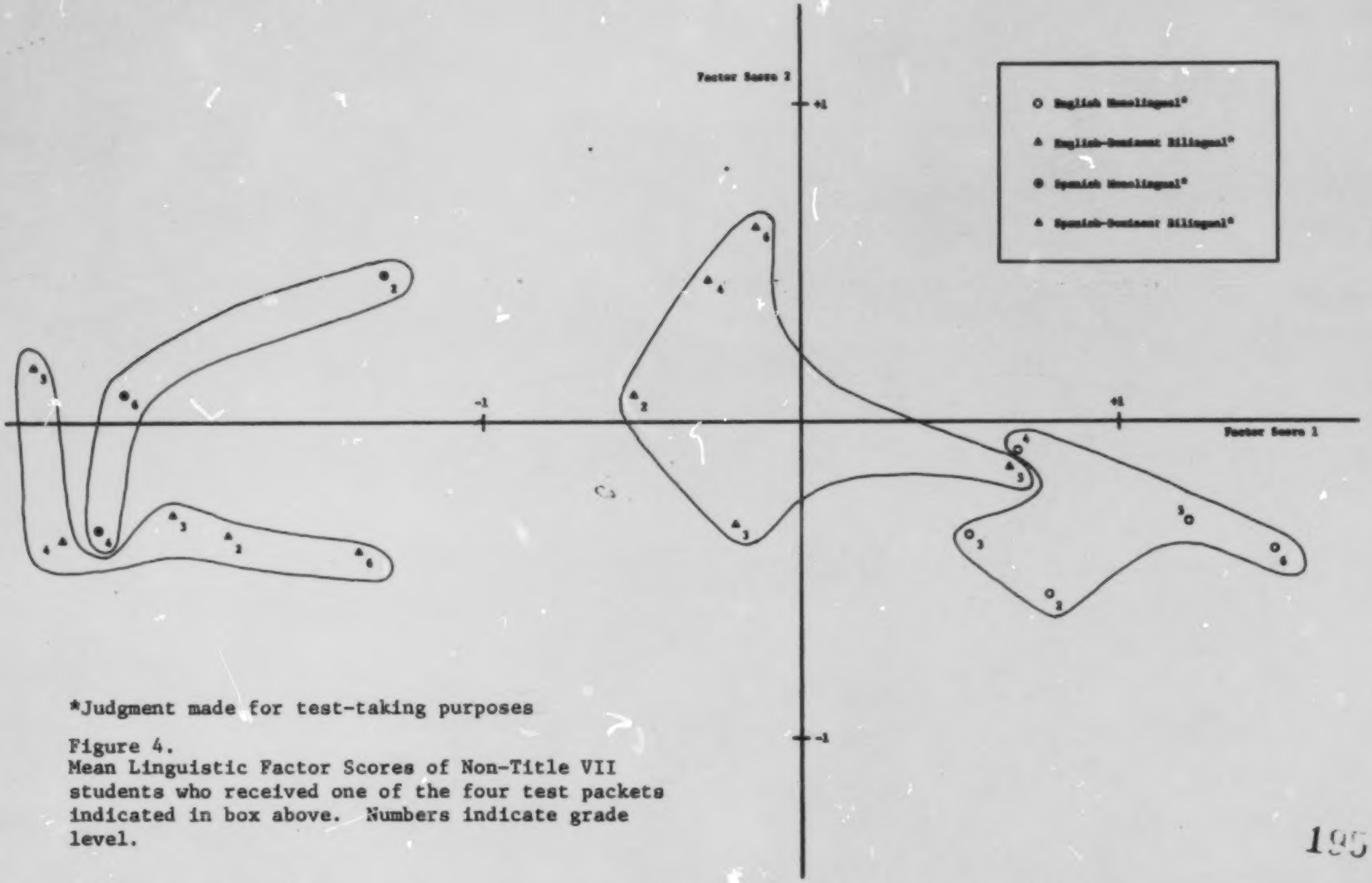
Reason for student being in Title VII classroom. One of the major findings reported in Volume I was the percent of students by Reason For Presence in a Title VII classroom. This table is reproduced here as Table II-B-32 so that the reader will have access to the data without referring back to Volume I.

As presented in Table II-B-32, and discussed in Volume I, generally less than a third of the Hispanic students were considered by their teachers to be enrolled in Title VII classrooms because of their need for English instruction. This finding was a critical one, having both educational and political implications, because of the ESEA Title VII legislation's specifications with regard to target students. Title VII legislation was designed to serve the needs of limited English-speaking ability students who have special need for English instruction. As



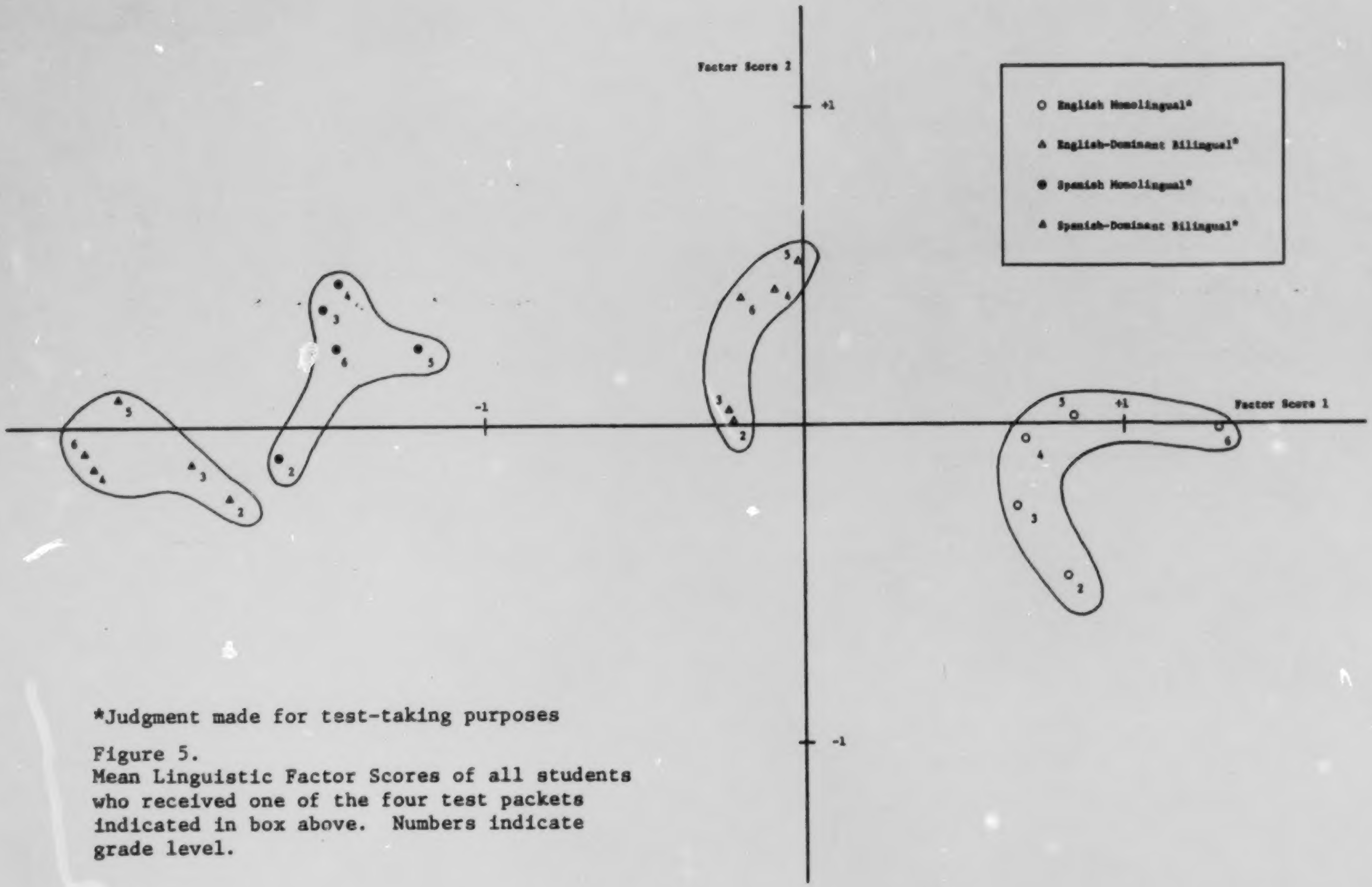
*Judgment made for test-taking purposes

Figure 3.
Mean Linguistic Factor Scores of Title VII students who received one of the four test packets indicated in box above. Numbers indicate grade level.



*Judgment made for test-taking purposes

Figure 4.
Mean Linguistic Factor Scores of Non-Title VII students who received one of the four test packets indicated in box above. Numbers indicate grade level.



*Judgment made for test-taking purposes

Figure 5.
Mean Linguistic Factor Scores of all students who received one of the four test packets indicated in box above. Numbers indicate grade level.

TABLE II-B-32

Percent[a] of Students by Reason for Being in Title VII Classroom

Ethnicity[b]	Spanish Surname					Need for English Instruction (limited English proficiency)					Parent Request					Already Bilingual					Other Reason				
	Grade					Grade					Grade					Grade					Grade				
	2	3	4	5	6	2	3	4	5	6	2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
Hispanic	9.2	6.8	9.1	5.8	11.0	35.3	29.8	29.2	19.2	26.8	31.6	38.9	26.5	33.9	34.6	9.4	11.3	26.2	19.5	19.0	14.5	13.2	8.9	21.6	8.6
White Non-Hispanic	3.0	1.3	1.4	0	1.7	0	.6	2.1	1.2	1.7	88.1	65.4	70.1	71.6	85.0	0	.6	5.6	0	5.0	8.9	32.1	20.8	27.2	6.7
Black	0	0	1.9	0	0	20.2	1.4	4.6	0	0	46.5	76.3	61.1	85.1	94.4	0	.7	3.7	0	0	33.3	21.6	28.7	14.9	5.6

---

[a] Number of students for whom these data were available:

	Grade				
	2	3	4	5	6
Hispanic	1074	1291	1312	1028	583
White Non-Hispanic	101	156	144	81	60
Black	99	139	108	67	18

[b] American Indian and Asian categories are not shown because only five to ten students were present per grade.

pointed out in the previous section, parental request is a basis upon which students may be enrolled in Title VII classrooms. (In fact, it is the primary way by which limited numbers of English-competent students may be enrolled.) Some reviewers suggested that the percent of Hispanic students who were enrolled because of parental request should be added to the percent of students enrolled because of their need for English instruction so that a more accurate picture of the percent of target Hispanic students in the Title VII classrooms could be obtained. It was reasoned that Hispanic students enrolled because of parental request could be as much in need of Title VII services as those enrolled because of their need for English instruction. To look further into this issue, additional analyses on the Hispanic Title VII students, stratified by reason for being in Title VII classrooms, were conducted. The results of these analyses appear in Tables II-B-33, II-B-34, and II-B-35. Table II-B-33 shows the CTBS Total Reading Score for Fall 1975 (the first test data point in the school year during which reason for being in the program was assessed) by each reason for enrollment; Table II-B-34 shows the Preference for English versus Spanish Factor Score by each reason; and Table II-B-35 presents Students' Judged Proficiency in English, Fall 1975 by each reason for enrollment. Across all grades in the Study, the Hispanic students enrolled because of their need for English instruction had significantly lower CTBS Reading scores, significantly lower preference for English versus Spanish, and significantly lower self-judged proficiency in English than those enrolled because of parental request ($p < .01$). (The interpretation of the Preference for English versus Spanish factor score has been explained earlier; essentially, the more negative the score, the less the preference for English.)

It thus appears reasonable to consider these two groups of students as being significantly different in their self-assessment of English proficiency, in their preference for English, and in their performance on the English Reading test. The Volume I finding that generally less than a third of Hispanic students enrolled in Title VII classrooms were there because of need for English instruction is not modified by these additional analyses. Students enrolled because of parental request do not show the same need for English instruction as do the students enrolled because of need for English instruction.

TABLE II-B-33

CTBS Reading Total Fall 1975 Expanded Scale Score--Hispanic Title VII Students by Grade and by Reason for Presence in Title VII Classrooms

Grade		Spanish Surname	Need for English Instruction	Parental Request	Bilingualism	Other
2	$\overline{X}$	237.42	231.96	246.71	256.01	255.81
	n	64	257	219	77	140
	SD	42.16	38.49	51.28	44.68	46.11
3	$\overline{X}$	303.46	267.43	293.60	305.29	309.58
	n	70	297	406	119	146
	SD	47.67	46.76	60.21	53.18	54.15
4	$\overline{X}$	342.51	290.00	342.70	346.73	314.63
	n	91	323	293	315	104
	SD	71.76	55.73	70.68	62.03	60.15
5	$\overline{X}$	342.82	307.02	349.10	376.63	361.76
	n	51	150	256	181	195
	SD	61.27	64.35	70.64	64.35	70.15
6	$\overline{X}$	392.00	319.27	383.60	383.45	401.72
	n	32	88	164	85	39
	SD	65.60	73.68	74.48	68.14	60.77

TABLE II-B-34

Preference for English versus Spanish Factor Score--Hispanic Title VII Students by Grade and by Reason for Presence in Title VII Classrooms

Grade		Spanish Surname	Need for English Instruction	Parental Request	Bilingualism	Other
2	$\bar{X}$	-1.09	-1.20	-0.79	-.56	-.67
	n	92	325	304	82	153
	SD	1.42	1.26	1.51	1.03	1.39
3	$\bar{X}$	-.17	-1.38	-.53	-.20	-.33
	n	80	349	458	134	155
	SD	1.32	1.24	1.35	1.24	1.40
4	$\bar{X}$	.13	-1.45	-.24	-.24	-.51
	n	98	349	317	324	112
	SD	1.14	1.28	1.34	1.09	1.09
5	$\bar{X}$	-.55	-1.28	-.27	-.06	-.17
	n	55	175	294	190	208
	SD	.94	1.28	1.40	.86	1.00
6	$\bar{X}$	.02	-1.30	-.43	-.24	-.33
	n	35	115	178	99	46
	SD	.90	1.35	1.36	.77	.72

TABLE II-B-35

Students' Judged Proficiency in English, Fall 1975--Hispanic Title VII Students by Grade and by Reason for Presence in Title VII Classrooms

Grade		Spanish Surname	Need for English Instruction	Parental Request	Bilingualism	Other
2	$\bar{X}$	2.46	2.38	2.54	2.47	2.45
	n	81	298	276	76	146
	SD	0.67	0.66	0.67	0.61	0.69
3	$\bar{X}$	2.62	2.29	2.59	2.67	2.68
	n	75	332	409	130	147
	SD	0.59	0.65	0.58	0.56	0.47
4	$\bar{X}$	2.77	2.40	2.73	2.73	2.60
	n	92	328	297	315	107
	SD	0.45	0.62	0.51	0.44	0.53
5	$\bar{X}$	2.61	2.39	2.74	2.78	2.70
	n	50	153	261	175	202
	SD	0.47	0.61	0.49	0.40	0.47
6	$\bar{X}$	2.70	2.32	2.69	2.66	2.79
	n	33	93	167	81	40
	SD	0.43	0.64	0.48	0.45	0.36

Educational goals for Title VII projects in the Study. Data collected from Title VII project directors and staff during the 1975-76 school year site visits by AIR staff indicated that over 85% of the projects retained Spanish-speaking students in their Title VII classrooms even after the students' proficiency in English would enable them to function in a regular classroom. In addition to the findings of the Impact Study, other independent studies have found a very high incidence of "maintenance" projects operating under Title VII funding (General Accounting Office, May 1976; Epstein, 1977). What was surprising was the concern of some reviewers over the accuracy of this finding when in fact the projects participating in the Impact Study were openly proud of their maintenance goals, which often included the objective that all children, including the English-monolingual and English-dominant students, become fluent in Spanish as well as in English. This information was elicited through interviews with Title VII project directors. The results of the interviews related to this finding were presented in Volume I. Additional interviews with Title VII teachers and direct observation of Title VII classrooms corroborated this finding. The detailed project goals and procedures for each Impact Study Title VII project were presented in Volume II and further document the project director interview findings.

Some bilingual educators suggest that the term "maintenance" program be reserved for those projects which have bilingual curriculum for kindergarten through grade 12. It seems much more appropriate to address the nature of each project and its goals for the grades which it encompasses. The project is, after all, the unit of Title VII funding, and the fact that it may encompass only kindergarten through grade 6 should not prevent an assessment of its goals. We are concerned here with the project's planned disposition of Hispanic students who learn enough English in the bilingual classroom to function in a regular classroom. That is, does the project have as a goal (1) the transfer of students into a regular classroom once they can understand the languge of instruction in the regular classroom (English) or (2) the retention of students in the Title VII bilingual project and the continuation of their Spanish-language instruction, with subject matter courses totally in Spanish or perhaps 50% in English and 50% in Spanish? The Impact Study, in an effort to avoid the semantic problems inherent in the terms "maintenance" and "transition", assessed this aspect of the project's goals and intentions by asking for specific project goals and action regarding what happens to students once they are able to function in school in English. Projects that have as a goal the transfer of the student into regular classrooms when he or she is able to do school work in English can clearly be said to have a "transition" approach to bilingual education. In such a project, the student who is moved into the regular classroom makes room in the bilingual classroom for other students who are more needy in terms of their English speaking and understanding ability. Projects that have as a goal the retention of the student in the bilingual classroom even after he or she can function in the regular English-speaking classroom cannot be said to be operating a "transition" approach as mandated by Congressional intent and Title VII legislation, even though the student may eventually enter a regular English language classroom when he or she leaves the bilingual project and goes on to junior high or high school. It should be noted that some projects operate in all classrooms and/or in all schools in an attendance area, so there are no "regular" classrooms available to which English-proficient students might transfer. Such projects obviously reflect a "maintenance" approach to bilingual education, less their guidelines call for increased instruction in English and decreased instruction in Spanish in the upper grades. (The Title VII projects in the Intensive Sample of the Impact Study spent, on the average, about equal amounts of time per week in English Reading/Language Arts and Spanish Reading/Language Arts in the sixth grade, which was the highest grade included in the Study.) Even if project guidelines were to call for increased instruction in English and decreased instruction in Spanish at the upper grades but there were no regular classrooms to which English-proficient students might transfer, it might still be debatable whether or not the Title VII funds are being used to educate the limited English-speaking ability children most in need of the mandated Title VII services.

III. EDUCATIONAL PROCESSES AND OUTCOMES

A. Objectives, Sampling Methodology, and Procedures

To examine the relationships between certain educational treatment characteristics and student outcome measures during the 1975-76 school year, several instruments were developed which document the educational treatment received by a sample of the students in both the Title VII and the Non-Title VII comparison schools in the Study. The development and use of these instruments were discussed in detail in Volume I. The information related to the educational treatments implemented by Title VII project and comparison schools was collected by AIR bilingual project staff during site visits to the participating schools and classrooms. Detailed treatment data were obtained through interviews and classroom observations for a subsample of the participating Title VII and Non-Title VII comparison classrooms. Site visitors interviewed the teachers in the Intensive Sample. They also interviewed team teachers, English as a Second Language (ESL) teachers, Spanish teachers, and other adults who interacted significantly with the students in the Intensive Sample classrooms.

The selection of this Intensive Sample for detailed treatment documentation was discussed in Volume I. Essentially, a stratification plan was devised to choose classrooms in grades 2 through 6 that would be studied in intensive detail during the 1975-76 school year. Within the set of Title VII classrooms participating in the Impact Study, half were selected for intensive analysis. Stratification was by grade-within-site, thereby preserving the basic representativeness of the Intensive Sample as far as Title VII-related characteristics were concerned. Non-Title VII classrooms were sampled in a similar manner and were also included in the Intensive Sample. In all, 161 classrooms were selected for intensive analysis, 120 of which were Title VII and 41 of which were Non-Title VII classrooms. All Title VII projects were represented in this intensive analysis subsample. Table III-A-1 shows by grade the distribution of the number of classrooms and students in the Intensive Sample.

TABLE III-A-1

Number of Title VII and Non-Title VII Students, Classrooms, Schools, and Sites Selected for the Intensive Sample by Grade

	Title VII						Non-Title VII					
	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Title VII Total	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Non-Title VII Total
Number of Students	848	821	714	669	383	3455	353	371	374	106	40	1244
Number of Classrooms	[illegible]	33	30	29	13	120[a]	12	14	13	4	2	41[a]
Number of Schools	29	29	26	25	12	82[b]	10	13	11	4	2	28[b]
Number of Sites	24	26	[illegible]	17	11	37[b]	9	13	10	[illegible]	2	19[b]

[a] The total number of classrooms does not equal the sum of classrooms at each grade level because multi-grade classrooms are counted once for each grade level.

[b] There were 101 Intensive Sample schools and 37 sites in the Process Analysis. The total number of Title VII and Non-Title VII schools and sites on this table exceeds the actual number because some schools and sites contain both Title VII and Non-Title VII classrooms.

B. Analysis Approach

The relationship between instructional process variables, and teacher/teacher aide characteristics, and contextual characteristics, and gains in cognitive and attitudinal outcomes was analyzed by means of one of the three methods of impact analysis utilized in evaluating Title VII Program impact. This method, standardized gain score analysis, has been described previously. In terms of the process analyses, however, we computed three partial correlations for each outcome variable/process characteristic:

- The partial correlation of the pretest (i.e., pretest or pre-attitude) with the process variable or characteristic
- The partial correlation of the posttest with the process variable or characteristic
- The partial correlation of pretest with posttest

To adjust statistically for the possibility that different kinds of students were members of classrooms in which different processes were present, the following covariables were partialed out of each of the variables involved in the three correlations noted above:

- Student socioeconomic status
- Number of school days between fall 1975 testing and spring 1976 testing
- Factor Score I ("Preference for English Versus Spanish")
- Factor Score II ("Use of Both English and Spanish")
- Factor Score Product (This variable was equal to the product of a given student's Factor Score I and Factor Score II and, in effect, allowed us to covary out the interaction of Factor Score I and Factor Score II.)

The difference between the pretest and posttest partial correlations was then computed and tested for statistical significance by means of a *t*-test for correlated correlations. As discussed previously, computing and testing partial correlations in this way is equivalent to analyzing standardized gain scores from which the effects of the covariables have been removed. Only those differences between partial correlations that were statistically significant at $p \leq .01$ have been reported. Although this seems like a very conservative level of significance for analyses that were, by design, intended to be descriptive and suggestive, rather than confirmatory, it should be noted that the theoretically correct degrees of freedom in the analyses of multilevel variables (i.e., variables such as student scores and classroom characteristics that are defined at different levels) is not the number of students minus the number of parameters estimated from the data. This is because student scores may vary among students while classroom attributes (such as the process variables and teacher characteristics analyzed here) may only vary among classrooms.

Issues involved in analyzing multilevel data of the kind examined in the process analyses presented here have been discussed by Coles, et al. (1976), and also by Wilson and Wise (1975). In brief, they propose that a more theoretically adequate estimate of the degrees of freedom can be derived by considering both the numbers of classrooms and the numbers of students included in the analyses of a given pair of variables. It was not possible to derive such estimates for the analyses described here, however, simply because the numbers of separate analyses reported (equal to the number of outcomes and processes analyzed at each of five different grade levels) were so large. A meaningful alternative was to evaluate the relationship of gains to processes with a more stringent level of statistical significance. The actual difference between each of the pretest/process and posttest/process partial correlations is also shown for those correlations which are statistically significant. This value, in effect, is an index of the magnitude of the relationship between a process and a standardized residual gain score.

Each partial correlation was based upon the scores of all students who were members of the Intensive Sample, who were present during both fall 1975 and spring 1976 (because their presence at these times suggested that they were present in the classroom during the pre/post interval and that they had been exposed to the instructional processes of that classroom) and who had both a pretest and posttest score for a given outcome variable. In some instances, there were missing data for the process or teacher variable or contextual variable involved. This occurred because a given process variable may have been inappropriate for a given classroom (e.g., in some classrooms the item, "Is English use permitted in Spanish classes," was not appropriate because there was no Spanish instruction per se). Missing data attributable to missing teacher data occurred because the teacher did not complete his/her questionnaire. In the teacher aide analyses, missing data could also be due to the fact that there was no aide in the classroom. The missing data on the contextual characteristics of Home and Neighborhood Use of English could be due to the parents' not returning the Parent Questionnaire or to their leaving the items involved in the scale blank.

In summary, then, the analyses presented and discussed here were based upon all students in the Impact Study's Intensive Sample for whom cognitive or attitudinal scores, process variables, teacher/teacher aide variables, and contextual variables were available. Since the objective of these process analyses was to assess the effects of various instructional strategies and to discover the more effective strategies for the kinds of students included in the Impact Study sample, the educational treatments of all the Intensive Sample students were included. No distinctions were made as to the source of funding for the educational processes (i.e., Title VII or Non-Title VII). Thus, these analyses should not be interpreted in the same way as the Title VII impact analyses discussed elsewhere in this report and in Volume I. Neither can these process analyses be viewed as an evaluation of all "bilingual education" processes since the sample of classrooms participating in the Intensive Sample and in the Impact Study were not chosen to be representative of the universe of classrooms implementing bilingual education practices but were by mandate of the Study restricted to Title VII bilingual projects and the comparison schools in the Study. Rather, the analyses conducted for this section of the report sought to identify those processes related to outcomes for the kinds of students sampled by the Impact Study and given the particular combinations of instructional processes to which they were exposed. Because of the wide variety of instructional processes present in participating Title VII and Non-Title VII classrooms, however, it seems reasonable to assume that these analyses are fairly comprehensive and that they do represent findings that should be generalizable to students such as those involved in the educational processes analyzed.

C. Processes, Characteristics, and Outcomes Analyzed

Educational Processes

Table III-C-1 presents the 25 Classroom Level Educational Process variables selected for analysis. Included in the table are the variable names and the number of items from the Classroom Level Educational Experience Analysis Guide (EdExAG) used to compute the variable score. (A more detailed description of each variable and response alternatives, the range of possible responses, and page references to the Classroom Level EdExAG appears in Table III-C-1a in Appendix III-C.) This instrument, its development, and use have been discussed in a previous section of this report and also in Volume I. The information related to these variables was obtained by Impact Study staff during interviews with the teachers from the Intensive Sample classrooms as well as with many team teachers, instructional aides, and other teachers and specialists who interacted with students in these classrooms.

The variable Average Teacher Hours per Student per Week was computed from the figures for weekly time spent with the children in a given classroom by each of the following: the regular classroom teacher, team teacher(s), special English language teachers, special Spanish language teachers, and special Mathematics teachers. Their weekly classroom hours were weighted by the number of students with whom they worked.

The Average Adult Hours per Student per Week was computed in a similar way, using the actual classroom time spent by any of the following: teachers, aides, volunteers, cultural resource persons from the community or school district office, school librarians, counselors or school psychologists, speech and/or hearing specialists, special education or learning disabilities specialists, English and/or Spanish as a Second Language teachers, Mathematics specialists, curriculum planners, community liaison personnel, and other outside consultants. It should be noted that personnel who interacted only with the teachers but not directly with the students were not included in this variable.

A distinction was made during the Classroom EdExAG interviews between English as a Second Lanaguage Instruction and English Reading and Language

TABLE III-C-1

Classroom Level Educational Process Variables

Process Variables	Number of Items
Average Teacher Hours per Student per Week	6
Average Adult Hours per Student per Week	35
English as a Second Language Is Taught	1
Spanish Language Arts Is Taught	1
Spanish as a Second Language	1
Whole-Class Instruction in English as a Percentage of Total English Instructional Time	12
Individualized Instruction in English as a Percentage of Total English Instructional Time	12
Group Instruction in English as a Percentage of Total English Instructional Time	12
Average English Hours per Student per Week	13
Grouping Index for English	6
ESL As Percentage of Total English Time	4
Spanish Use Allowed in English Classes	1
Whole-Class Instruction in Spanish as a Percentage of Total Spanish Instructional Time	12
Individualized Instruction in Spanish as a Percentage of Total Spanish Instructional Time	12
Group Instruction in Spanish as a Percentage of Total Spanish Instruction Time	12

(continued)

TABLE III-C-1 (continued)

Classroom Level Educational Process Variables

Process Variables	Number of Items
Average Spanish Hours per Student per Week	13
Grouping Index for Spanish	6
SSL as Percentage of Total Spanish Time	4
English Use Allowed in Spanish Classes	1
Whole-Class Instruction in Mathematics as a Percentage of Total Mathematics Instructional Time	4
Individualized Instruction in Mathematics as a Percentage of Total Mathematics Instructional Time	4
Group Instruction in Mathematics as Percentage of Total Mathematics Instructional Time	4
Average Mathematics Hours per Student per Week	7
Grouping Index for Mathematics	3
Spanish Use Allowed in Mathematics Class	1

Arts as taught for native-English speakers. In some classrooms, these categories overlapped, for example where all students in a class were learning English as their second language, so the classroom's "regular" English Language Arts program was in effect an English as a Second Language (ESL) program. The same distinction was made between Spanish as a Second Language and Spanish Reading and Language Arts for native-Spanish speakers. The variables Average Spanish Hours per Student per Week and Average English Hours per Student per Week include both second language and "regular" Reading and Language Arts for both languages. Average Hours per Student per Week spent in Mathematics Instruction includes all time spent on this subject on this subject whether taught by the classroom teacher or by a special Mathematics teacher.

Twelve variables were used to describe the organization of the Impact Study Intensive Sample classrooms. The following terms are used in these process variables. "Whole-Class Instruction" refers to the situation in which the teacher or aide instructs the entire class as a unit. When a teacher or aide gives one-to-one instruction to a student working on assignments made on an individual basis, this is called "Individualized Instruction." "Group Instruction" is defined as any subsection of a class larger than one person working together for instructional purposes. Our definition of "group" includes ability groups, language dominance groups, skill-needs groups and, in fact, groups formed on any basis, as long as they are for instructional purposes.

Three Grouping Indices--for English, for Spanish, and for Mathematics--were devised to measure the extent to which a classroom used grouping as an educational treatment. A need for this measure was recognized when it was noted that some classrooms separated out a few students (e.g., the Spanish-monolingual students) for Group Instruction, while the rest of the students were given Whole-Class or Individualized Instruction. The Grouping Index allows us to compare such a situation with one in which a classroom was divided into, for example, three or four groups of equal size. An Index of 0 means there is no grouping for this subject area, but there is Whole-Class or Individualized Instruction instead. An Index of less than 1 means that some children are pulled aside for Group Instruction, as in the first example above. An Index equal to 1 indicates a case where all the students receive Group Instruction. An Index greater than 1 indicates that the class is grouped more than once for the subject area (English, Spanish, or Mathematics), for example, when a classroom organizes into spelling groups, Reading groups, and oral language groups, all for instruction in English Language Arts. In summary, the higher the Grouping Index number, the greater the amount of grouping occurring in the classroom.

Three variables are designed to show classroom patterns of English and Spanish language use by subject area. During the interviews, teachers were asked if they allowed their students to use English during the Spanish Language Arts instruction and if they allowed them to use Spanish during English Language Arts instruction. The possible responses were "Yes, freely," "Yes, when absolutely necessary," and "No." A "No" answer for a Language Arts subject implied that the teacher encouraged "total immersion" in that language, be it English or Spanish. The two "Yes" answers implied increasingly flexible approaches to classroom language use. Teachers were also asked if they allowed the use of Spanish during Mathematics instructional periods.

Contextual Characteristics

Two variables describe something of the classroom context in which the teacher and students operate. These contextual characteristics, as well as the classroom process and teaching staff characteristics are analyzed in terms of their impact on student outcome. Home and Neighborhood Use of English is a scale based on Parent Questionnaire items tapping language used in home, in the neighborhood, by parents with own children, and by children with own parents. (The specific response alternatives and coded values are shown in Appendix III-C, Table III-C-2a.) This questionnaire was administered to parents of children in the Intensive Sample classrooms and is described more fully in Volume I.

The other contextual characteristic considered is the Proportion of Hispanic Students in the Classroom. This percentage was calculated by selecting from the Impact Study data base those students present for both fall 1975 and spring 1976 testing in each Intensive Sample classroom. The teacher-completion section of the Student Questionnaire provided information on the ethnicity of each student. The number of Hispanic students for each classroom was determined and then divided by the total number of students in the data base for that classroom.

Teacher and Teacher/Aide Characteristics

Since characteristics of the teaching staff are thought to be a factor affecting student school performance, the teachers and teacher aides responsible for the students included in the Impact Study were given a Teacher/Teacher Aide Questionnaire. The questionnaire was administered to all classroom teachers and teacher aides of the Title VII and Non-Title VII classrooms participating in the Impact Study. The questionnaire consisted of 52 multiple-choice items and was printed in both English and Spanish. Volume I contained a description of the development of this questionnaire and presented informaton about some of the general characteristics of Title VII and Non-Title VII teachers and aides. This section addresses the relationship between some selected teacher and teacher aide characteristics and student performance.

Table III-C-2 shows the Teacher/Teacher Aide Characteristics variables to be analyzed and the number and general content of the items from the Teacher/Teacher Aide Questionnaire used to compute the variable scores. (A more detailed description of each variable, response categories, and coded values appears in Appendix III-C, Table III-C-3a.)

Two variables relate to teaching qualifications for both the teachers and the teacher aides. Teacher Overall Qualifications is a scale which consists of information on the teacher's or aide's highest college degree, the type of teaching credential held, and the number of years of teaching experience. Teacher Bilingual Qualifications provides information related to experience and training specifically in the area of bilingual education: teachers and aides were asked to indicate the number of years they had taught in a bilingual program classroom and the number of units of college training devoted directly to bilingual education that they had had. They were also asked for information about the extent of their participation in inservice training and in state or national conferences devoted to bilingual education.

TABLE III-C-2

Teacher and Teacher Aide Characteristic Variables

Variable	Number of Items	Item Content
Teacher Overall Qualifications and Teacher Aide Overall Qualifications	3	Highest college degree . . .
		Type of state teaching credential . . .
		Years of full-time teaching experience . . .
Teacher Non-Classroom Use of English and Teacher Aide Non-Classroom Use of English	6	Language used in home . . .
		Language used with own children . . .
		Language used with bilingual friends . . .
		Judged language proficiency as a child . . .
		Judged language proficiency as a teenager . . .
		Judged present language proficiency . . .
Teacher Non-Classroom Use of Spanish and Teacher Aide Non-Classroom Use of Spanish	6	Language used in home . . .
		Language used with own children . . .
		Language used with bilingual friends . . .
		Judged language proficiency as a child . . .
		Judged language proficiency as a teenager . . .

(continued)

TABLE III-C-2 (continued)

Teacher and Teacher Aide Characteristic Variables

Variable	Number of Items	Item Content
(continued)		Judged present language proficiency . . .
Teacher Bilinguality and Teacher Aide Bilinguality	6	Language used in home . . . Language used with own children . . . Language used with bilingual friends . . . Judged language proficiency as a child . . . Judged language proficiency as a teacher . . . Judged present language proficiency . . .
Teacher Bilingual Teaching Qualifications and Teacher Aide Bilingual Teaching Qualifications	4	Years of teaching in a bilingual program . . . College training in bilingual education . . . Inservice training in bilingual education . . . Attendance at conferences on bilingual education . . .

The second area of interest to the Impact Study relates to teacher/teacher aide language capability and use. There are separate variables for teacher use of English and teacher use of Spanish. The teachers and aides answered six questions for English and six for Spanish regarding their past and their present language proficiency and non-classroom language use--in their own homes and with their families and friends. Responses to these same six questions were recoded and combined to describe the teachers' and aides' degree of English/Spanish bilinguality.

Educational Outcomes

The Study assessed the relationship between the process variables, Teacher/Teacher Aide Characteristics variables, the Contextual Characteristics variables, and the gains on the following outcome measures:

- English Language Arts
- Spanish Language Arts
- Mathematics
- Student attitudes

The outcome variables for English Reading are the CTBS Reading Total Expanded Standard Score, the CTBS Reading Total Expanded Standard Score (Rescored), the CTBS Reading Vocabulary Expanded Standard Score, and the Prueba de Comprensión Auditiva Inglés Total Scaled Score (English as a Second Language Score). The Spanish Reading measures are the Prueba de Lectura Total Raw Score (Spanish Reading Score) and the Spanish as a Second Language Score. For Mathematics, the outcome variables are the CTBS Mathematics Computation Expanded Standard Score and the CTBS Mathematics Total Expanded Standard Score. (See Table IV-A-1a of Appendix IV-A in Volume I for a description of the CTBS and other cognitive outcome measures.)

The student attitude measures are based upon the student-completed portion of the Student Questionnaire. Table III-C-3 shows the number and general content of the items making up each of the three attitude scales: Attitude Toward School, Attitude Toward English, and Attitude Toward Spanish. (The specific item response categories and the coded values are shown in Appendix III-C, Table III-C-4a.)

TABLE III-C-3

Student Questionnaire Outcome Variables

Variable	Number of Items	Item Content
Attitude Toward School	5	How do you like school? . . . When I'm at school in the classroom, I feel . . . When I'm at school in the playground, I feel . . . When I'm in the classroom studying in a group, I feel . . . When I'm in the classroom studying by myself, I feel . . .
Attitude Toward English	9	I like to speak English . . . I like doing songs, dances, and plays in English . . . I like reading in English . . . How do you like learning English . . . When I am learning about English-speaking people, I feel . . . When I'm with classmates who speak English, I feel . . . At school, when I speak English, I feel . . . When the teacher speaks to me in English, I feel . . . When the teacher's helper speaks to me in English, I feel . . .

(continued)

TABLE III-C-3 (continued)

Student Questionnaire Outcome Variables

Variable	Number of Items	Item Content
Attitude Toward Spanish	9	I like to speak Spanish . . .
		I like doing songs, dances, and plays in Spanish . . .
		I like reading in Spanish . . .
		How do you like learning Spanish? . . .
		When I am learning about Spanish-speaking people, I feel . . .
		When I'm with classmates who speak only Spanish, I feel . . .
		At school when I speak Spanish, I feel . . .
		When the teacher speaks to me in Spanish, I feel . . .
		When the teacher's helper speaks to me in Spanish, I feel . . .

D. Results: Correlates of Educational Outcomes

Relationship Between Instructional Processes and Outcomes

Standardized gain score analysis for English Language Arts educational processes. The results of the analysis of the educational processes associated with English Language Arts are shown in Appendix III-D, Tables III-D-la through III-D-5a.

Findings by grade. For grade 2, significant relationships were found between Average Hours of English Instruction per Student per Week and gains in the CTBS Reading and Vocabulary scores, and this suggests that for second grade students the more time spent in English Language Arts instruction, the greater the gain in the English Languages Arts test performance.

Average Adult Hours per Student per Week was negatively correlated in the second grade with gains in Attitude Toward School. It might be that more adult hours are associated with students who perhaps need greater supervision, whose attitude toward school is poor, and whose attitude does not improve over the school year. The extent to which Spanish was permitted in English classes was negatively related to Attitude Toward Spanish; the more Spanish allowed in English classes, the lower the gain in Attitude Toward Spanish. The extent of grouping for English instruction was positively related to gains in Attitude Toward Spanish.

In the grade 3 analysis, the extent of grouping of the students for instruction in English was positively related to gains in the CTBS Reading and Vocabulary scores. As noted in the discussion of the process variables, the Grouping Index measures the extent to which the students are grouped and perhaps regrouped. This suggests that higher English Reading and Vocabulary gains are associated with those educational processes which involve dividing the students into smaller groups for instruction in English. The smaller groups are generally made up of a more homogeneous group of students than the larger, whole class. No other significant relationships were found in the third grade.

The grade 4 analysis also showed positive significant relationships between the average hours of English instruction and English test performance gains on the CTBS. Grouping was also significant in this grade as reflected by the positive relationships between gains on the English Reading scores and the Grouping Index, the amount of instruction conducted in groups, and the amount of Individualized Instruction. Consistent with this relationship is the negative relationship between the amount of time spent in Whole-Class Instruction and the Reading outcome measures. Clearly, the pattern is that the more time spent in English instruction and the more this time is allocated to Group or Individualized Instruction as opposed to Whole-Class Instruction, the higher the gains in the CTBS English score for this grade. Spanish Use Allowed in English Classes was related to increases in attitude toward English.

For grade 5, there was a significant positive relationship between the extent of grouping and the ESL score gains. The greater the extent of grouping, the greater the gain. Other relationships were negative and suggest that, in fact, more time was being devoted to those students who were in most need of the additional instructional time. It would not be unusual to find that the relationship between total time and performance was negative if the lower performing students were the students who were receiving the greater amount of teacher and teacher aide instructional time. This appears to be the case in this grade.

Average Teacher Hours per Student per Week was related positively to Attitude Toward English in grade 5. That is, the smaller the student/teacher ratio in the class, the greater the gain in the student's Attitude Toward English.

There were no significant relationships between any of the process variables and the outcomes for the sixth grade.

Summary. The standardized gain score analysis for English Language Arts educational processes did not show a completely consistent pattern for any of the process variables and outcomes across all the grades in the Study (grades 2 through 6). However, for three of the grades (3, 4, and 5), the extent of grouping was significantly positively related to gains in one or more of the measures used to assess English proficiency. That is, the greater the grouping and regrouping, the greater the gains. The number of hours per week devoted to English Language Arts instruction was positively related to English proficiency gains in two of the five grades (grades 2 and 4). The negative relationship in grade 5 was discussed, as was the possibility that at upper grades a kind of compensatory teacher time allocation results in poorer performers receiving more instruction time. There was no particular relationship, either positive or negative, for grades 3 and 6.

Standardized gain score analysis for Mathematics educational processes. The results of the analysis of the educational processes associated with gains in Mathematics are shown in Appendix III-D, Tables III-D-6a through III-D-10a.

Findings by grade. For grade 2, Mathematics Computation gains were associated with the amount of Mathematics instruction the student received and with the extent to which the instruction was not in a whole-class situation. The more instruction time in Mathematics, the greater the gain; and the more the instruction was individualized, the greater the gain in this grade. Also, permitting the use of Spanish in the Mathematics classes was positively associated with Mathematics Computation gains in this grade.

In grade 3, the only significant relationship was between the Average Teacher Hours per Student per Week and the Mathematics Computation gain. The greater the Average Teacher Hours per Student, the greater the Mathematics Computation gain. This was not the average Mathematics instruction hours, but total teacher availability per student. which would seem to be related to a general student/teacher ratio.

The amount of Individualized Mathematics Instruction and Average Hours Spent per Week in Mathematics were both positively related to Mathematics Computation and total Mathematics gains in the fourth grade. While the Grouping Index in Mathematics was negatively related to Mathematics Computation gains, it should be remembered that the various indices associated with classroom structure were measured independently, and it is possible that the extent of individualization on a one-to-one basis may be positively related while various types of grouping may not be. The average number of teacher and adult hours was negatively associated with the Mathematics gains.

In grade 5, both the Average Teacher Hours per Student per Week and the Average Adult Hours per Student per Week were positively related to gains in Mathematics. Extent of Grouping and Proportion of Group Instruction were also positively related to Mathematics gains. Associated with the grouping finding was the negative correlation with Proportion of Whole-Class Instruction. That the students needing the most Mathematics instruction were receiving it may be evidenced by the negative correlation between Hours Spent in Mathematics Instruction and gains.

In grade 6, again, grouping was positively correlated with Mathematics gains. The less Whole-Class Instruction there was in Mathematics and the greater proportion of Mathematics instruction spent in Group Instruction, the greater the Mathematics Computation gains. However, Extent of Individualized Instruction seemed to be negatively correlated with such gains. Perhaps this could be due to the possibility that by the sixth grade only those students who were quite poor performers in Mathematics were receiving individualized instruction while the others were involved with group instruction.

Summary. The relationships between Mathematics gains and hours per week devoted to Mathematics were the same across grades as those found for English Language Arts. That is, there was a significant positive relationship in grades 2 and 4, a negative relationship in grade 5, and no significant relationship either positive or negative for grades 3 and 6. The negative grade 5 finding may be due to the same assignment phenomenon as discussed in the English Language Arts section.

While the pattern is not complete across grades, it does appear that the more Whole-Class Instruction there is, the less the Mathematics gains; and the more grouping or individualized instruction, the greater the gains. The positive relationship between Extent of Individualization and Mathematics gains was found in grades 2 and 4. Extent of Group Instruction and Mathematics gains were positively associated in grades 5 and 6, and the negative relationships between Extent of Whole Class Instruction and Mathematics gains were found in grades 2, 5, and 6.

Spanish Use Permitted in Mathematics Class was positively related to Mathematics gains in grade 2; however, there were no significant relationships between this variable and Mathematics gains at other grade levels.

Standardized gain score analysis for Spanish Language Arts educational processes. Appendix III-D, Tables III-D-11a through III-D-15a, show the results of the analysis of educational processes associated with Spanish instruction.

Findings by grade. Average Spanish Hours per Student per Week was positively related to the Spanish as a Second Language (SSL) score gains in grade 2, as was the Grouping Index for Spanish. Attitude Toward Spanish was positively related to several process variables: Spanish Language Is Taught, Percent of Group Instruction, Average Spanish Hours per Student per Week, Grouping Index for Spanish, and SSL as a Percentage of Total Spanish Time. The two variables related to total amount of teacher and adult time were negatively related: Average Total Teacher Time was negatively related to SSL score, and Total Adult Time was related negatively to Attitude Toward School.

In grade 3, again, the more time spent in Spanish Language Arts instruction, the greater the SSL (Spanish as a Second Language) score gains. The greater the Extent of Grouping for Spanish Language Arts Instruction, the greater the gains in SSL.

In grade 4, again, Grouping and Time spent in Spanish Language Arts Instruction were positively related to SSL gains. Spanish Language Arts Is Taught was positively related to SSL and Spanish Reading gains. There were no other significant relationships between the process variables and the Spanish outcome measures in this grade.

English Use Allowed in Spanish Classes was negatively related to gains in SSL scores and to Attitude Toward English in the fifth grade. However, the Use of English during Spanish Language Instruction was positively related to the Prueba de Lectura (Spanish Reading) score. It will be recalled that the SSL (Spanish as a Second Language) test measured a much lower level of Spanish proficiency than the Prueba de Lectura, which was a more difficult Spanish proficiency instrument designed for students who were more advanced in written Spanish language activities. The Grouping Index for Spanish was positively related to Prueba gains; that is, the greater the grouping of the students, the greater the gain on the more difficult Spanish Reading Test. Average Teacher Hours per Student per Week was positively related to Attitude Toward English, but negatively associated with the gain in the Prueba score.

The grade 6 analysis showed that the Grouping Index for Spanish and Spanish Language Arts Is Taught were positively related to gain in the SSL scores. The teaching of SSL in the class was associated with a gain in the Prueba scores. Average Teacher Hours per Student per Week was negatively related to gains in the Spanish Reading scores. Both the Extent of Grouping and the fact that Spanish Language Arts was taught were positively related to gains in Attitude Toward Spanish. The results associated with the Prueba for the fifth and sixth grades should be interpreted with caution because of the low test/retest reliability of the Level 2 Prueba, which was used at these grade levels in our sample.

Summary. There was a consistent positive relationship between Extent of Grouping and gains in the Spanish as a Second Language test scores across most of the grades (2, 3, 4, and 6); and in grades 5 and 6 the Extent of Grouping was also positively related to the Spanish Reading test.

Average Spanish Hours per Student per Week was positively related to gains in the Spanish as a Second Language scores in grades 2, 3, and 4. There were no significant relationships between Hours Per Week and SSL gains in grades 5 and 6. There were no significant relationships at any grade between Hours per Week in Spanish and the Spanish Reading test score gains.

Relationship Between Contextual Characteristics and Outcomes

Tables III-D-16a through III-D-20a, in Appendix III-D, show the significant relationships between outcomes and the Contextual Characteristics variables.

Findings by grade. In grade 2, higher proportions of Hispanic students in a classroom is positively related to the gains in student attitudes toward both the Spanish and the English languages. However, the higher the proportion of Hispanics in a classroom, the poorer the gains on the Mathematics Computation test and on the Prueba de Lectura.

In grade 3, Home and Neighborhood Use of English was negatively related to SSL gains and to Attitude Toward School. Proportion of Hispanics in the Classroom was positively related to SSL gains and negatively related to CTBS Mathematics scores. Students who come from more English-dominant homes and neighborhoods were, in this grade, less likely to increase their attitude toward school during the school year. They were also less likely to have gains in SSL. For the most part, then, it appears that the students for whom Spanish as a Second Language is more appropriate are experiencing less gain, assuming that Spanish as a Second Language instruction is primarily directed at English-dominant students.

In grade 4, the greater the Proportion of Hispanic students in the Classroom, the lower the CTBS English Reading and Mathematics gains and the greater the gains in SSL. The greater the Home and Neighborhood Use of English, the lower the gains in SSL.

In grade 5, Proportion of Hispanics in the Classroom was positively related to CTBS English Reading scores and Mathematics scores. This is the opposite of the grade 4 findings related to the relationship between Proportion of Hispanics in the Classroom and these outcome measures.

In grade 6, there were no significant relationships between the contextual variables and the outcome measures.

Summary. There was very little consistency across grades in the relationship between these two contextual variables -- Home and Neighborhood Use of English and Proportion of Hispanic Students in the Classroom--and any of the outcome measures. The greater the Home and Neighborhood Use of English, the lower the gains in the Spanish as a Second Language scores in grades 3 and 4. The greater the Proportion of Hispanic Students in the Classroom, the greater the gains in the SSL scores in grades 3 and 4.

Relationship Between Teacher and Teacher Aide Characteristics and Outcomes

Tables III-D-21a through III-D-25a, in Appendix III-D, show the significant relationships between Teacher and Teacher Aide Characteristics and all of the student outcome measures.

Findings by grade. In grade 2, no significant relationships were found between the Teacher/Teacher Aide Characteristics and gains in any of the English Reading scores. Gains in the ESL scores were positively related to Teacher Non-Classroom Use of Spanish, but negatively related to Aide Bilingual Teacher Qualifications and Teacher Non-Classroom Use of English. Gains in Spanish as a Second Language (SSL) scores were negatively related to Aide Overall qualifications. There was no significant relationship with the Spanish Reading test (Prueba de Lectura). Gains in the Mathematics Computation scores were negatively associated with Teacher Overall Qualifications, and positively related to Teacher Bilingual Qualifications. The total Mathematics score gains were negatively related to Teacher Non-Classroom Use of English, and positively related to Teacher Non-Classroom Use of Spanish.

In the second grade, gains in Attitude Toward School were negatively associated with Aide Non-Classroom Use of English, but positively related to Aide Non-Classroom Use of Spanish and Aide Bilingual Teacher Qualifications. There were no significant relationships between Teacher/Teacher Aide Characteristics and Attitude Toward English. Gains in Attitude Toward Spanish were positively associated with Aide Bilingual Teacher Qualifications.

In grade 3, there were no significant relationships between gains in the English Reading scores or the ESL scores and any of the Teacher/Teacher Aide Characteristics. Gains in the Spanish as a Second Language test scores were positively related with Teacher Bilinguality, but negatively related to Aide Overall Qualifications and Aide Bilingual Teacher Qualifications. Gains in the Spanish Reading test were positively related to Teacher Non-Classroom Use of Spanish and negatively related to Teacher Non-Classroom Use of English. The gains in the Mathematics Computation scores were negatively associated with Teacher Overall Qualifications, and positively related to Aide Bilinguality. The Mathematics Total Score gains were negatively related to Aide Overall Qualifications, and positively related to Aide Bilinguality.

In the third grade, gains in Attitude Toward School were positively related to Teacher Non-Classroom Use of Spanish, Teacher Bilinguality, and Aide Bilinguality. Such attitude gains were, however, negatively related to Aide Bilingual Teacher Qualifications. There were no significant relationships between Teacher/Teacher Aide Characteristics and gains in Attitude Toward English and in Attitude Toward Spanish.

In grade 4, the English Total Reading Score, English Total Reading Score (Rescored), and English Reading Vocabulary Score gains were all positively related to Aide Non-Classroom Use of English, and negatively related to Aide Non-Classroom Use of Spanish. Teacher Overall Qualifications was also negatively related to gains in these scores. Teacher Bilinguality was positively related to the Total and Total Rescored scores, while Aide Bilinguality was negatively related to gains in the English Reading Vocabulary Score. No significant relationships were found between Teacher/Teacher Aide Characteristics and the ESL and SSL scores. Gains in the Spanish Reading test were positively associated with Teacher Non-Classroom Use of Spanish and Teacher Bilinguality, and negatively related to Teacher Non-Classroom Use of English. Mathematics Computation Score gains were positively associated with Teacher Non-Classroom Use of English, and negatively associated with Teacher Non-Classroom Use of Spanish and Teacher Bilinguality. Teacher Non-Classroom Use of Spanish was also negatively associated with Mathematics Total Score gains.

In the fourth grade, gains in Attitude Toward School were negatively related to Aide Non-Classroom Use of English and positively related to Aide Non-Classroom Use of Spanish. Gains in Attitude Toward English were positively related to Aide Overall Qualifications, but negatively associated with Aide Bilinguality. Teacher Non-Classroom Use of English was positively related to gains in Attitude Toward Spanish.

In grade 5, the English Total Reading Score gains were positively related to Teacher Bilingual Qualifications and Aide Non-Classroom Use of Spanish. They were negatively related to Aide Non-Classroom Use of English. There were no significant relationships between Teacher/Teacher Aide Characteristics and the English Reading Vocabulary Score or ESL scores. The gains in the SSL scores were positively associated with Aide Non-Classroom Use of Spanish and negatively related to Aide Non-Classroom Use of English. However, the gains in the Spanish Reading scores were positively related to Teacher Non-Classroom Use of English, and negatively associated with Teacher Non-Classroom Use of Spanish and Teacher Bilinguality. (As pointed out in Volume I, the internal consistency reliability of the Spanish Reading test used in the fifth and sixth grades was not very high, and results related to student performance on this instrument should take this fact into account.) Gains in Mathematics Computation scores were positively associated with Aide Overall Qualifications, Aide Non-Classroom Use of Spanish, and Aide Bilinguality. It was negatively related to Aide Non-Classroom Use of English.

The same relationships were also found with the Mathematics Total scores with the addition of a positive relationship between Teacher Non-Classroom Use of Spanish.

In the fifth grade, Attitude Toward School and Attitude Toward English were both positively related to Aide Non-Classroom Use of Spanish and negatively related to Aide Non-Classroom Use of English. There were no significant relationships between Teacher/Teacher Aide Charactersitics and Attitude Toward Spanish.

In grade 6, gains in the English Total Reading Scores were negatively related to Teacher Non-Classroom Use of Spanish. There were no significant relationships between gains in ESL, SSL, Spanish Reading Test scores, Attitude Toward School, Atttitude Toward English, or Attitude Toward Spanish. Mathematics Computation gains were negatively associated with Teacher Non-Classroom Use of English. Teacher Bilingual Qualifications was negatively related to gains in Mathematics Computation and in Mathematics Total Score.

Summary. The relationships between almost all of the characteristics of teachers and teacher aides and student outcome measures did not extend across more than one or two grades; and at times, a given characteristic, was positively related with an outcome for one grade and negatively related for the same outcome measure for another grade. Teacher Non-Classroom Use of English was negatively associated with gains in the Spanish Reading test scores in two grades (3 and 4) and positively related to such gains in another grade (5). The opposite pattern was found between Teacher Non-Classroom Use of Spanish and gains in the Spanish Reading test (positively related in grades 3 and 4; negatively related in grade 5). There was no significant relationship between Teacher Non-Classroom Use of English and Teacher Non-Classroom Use of Spanish and Spanish Reading Score gains in the other two grades (2 and 6). Teacher Bilinguality was positively related to the Spanish Reading Score in only one grade; it was negatively related in another grade; and it had no relationship in the other grades.

Gains in Attitude Toward School, Attitude Toward English, and Attitude Toward Spanish were all generally unrelated to any of the Teacher Characteristics, with Teacher Overall Qualifications being unrelated in all grades, Teacher Bilinguality being related to these attitude gains in only one grade, Teacher Non-Classroom Use of English being related in only one grade, and Teacher Non-Classroom Use of Spanish being related in only one grade.

Teacher Characteristics, Teacher Overall Qualifications, Teacher Bilingual Qualifications, and Teacher Bilinguality were generally unrelated to gains in any of the English Reading Score or ESL score gains. A given characteristic was related to an English Reading outcome gain in only one grade. For all the other grades, there was no significant relationship, either positive or negative.

Aide Bilinguality and Aide Bilingual Teacher Qualifications were also generally unrelated to English Reading Score or ESL score gains; and the two relationships which were found were both negatively related to gains in grades 2 and 4. The Aide Non-Classroom Use of English and Aide Non-Classroom Use of Spanish (which can be thought of as some indication of the general language use pattern of the individual) each were related in only two grades, and the relationship for each was positive in one grade and negative in the other.

Mathematics score gains were not related to any of the Teacher/Teacher Aide Characteristics across grades. Again, the relationship between a given characteristic and a Mathematics score gain was sometimes positive for one grade and negative for another. Teacher Bilinguality was related to Mathematics gains in only one grade (4), and this relationship was negative. Aide Bilinguality was, however, positively related to Mathematics gains in two grades (3 and 5).

While Teacher Characteristics were found to be generally unrelated to gains in any of the attitude measures, Aide Characteristics were found to be positively related to Attitude Toward School gains in three grades (2, 4, and 5). The greater the Aide Non-Classroom Use of Spanish in these grades, generally, the greater the gain in Attitude Toward School.

It thus appears that teacher and teacher aide qualifications (overall and bilingual) and bilinguality characteristics have little relationship to English Reading Score or English as a Second Language score gains. However, Aides who are more Spanish dominant, as reflected by their non-classroom use of Spanish, have a positive effect on gains in Attitude Toward School in three of the six grade levels in the Study. Teacher qualifications (overall and bilingual) and bilinguality also appear to have little relationship with Mathematics and Attitude Toward School, Attitude Toward English and Attitude Toward Spanish gains.

IV. SUMMARY OF FINDINGS

The findings discussed in this volume can be grouped into the following major areas:

- Nature of the student population served by Title VII projects in the Study
- Educational goals of Title VII projects in the Study
- Title VII impact on student achievement and attitudes
- Relationships between gains in student achievement and attitudes and instructional process variables, contextual characteristics, and teacher/teacher aide characteristics

A. Nature of the Student Population Served by Title VII Projects in the Study

One of the major findings reported in Volume I and further investigated in this volume was the percent of students by Reason for Presence in a Title VII classroom. Generally less than a third of the Hispanic students were considered by their teachers to be enrolled in Title VII classrooms because of their need for English instruction.

This finding was an important one, having both educational and political implications, because of the ESEA Title VII legislation's specifications that Title VII target students should be of limited English-speaking ability.

Following the presentation of this finding in Volume I, some reviewers suggested that the percent of Hispanic students who were enrolled because of parental request should be added to the percent of students enrolled because of their need for English instruction so that a more accurate picture of the percent of target Hispanic students in the Title VII classrooms could be obtained. It was reasoned that Hispanic students enrolled because of parental request could be as much in need of Title VII services as those enrolled because of their need for English instruction. To look further into this issue, additional analyses on the Hispanic Title VII students, stratified by reason for being in Title VII classrooms, were conducted. Across all grades in the Study, the Hispanic students enrolled because of their need for English instruction had significantly lower CTBS Reading scores, significantly lower preference for English versus Spanish, and significantly lower self-judged proficiency in English than those enrolled because of parental request. The Volume I finding that generally less than a third of Hispanic students enrolled in Title VII classrooms were there because of need for English instruction is therefore not modified by these additional analyses.

B. Educational Goals of Title VII Projects in the Study

Another major finding presented in Volume I and further examined in this volume was that over 85% of the projects retained Spanish-speaking students in their Title VII classrooms even after the students' proficiency in English would enable them to function in a regular classroom.

This finding was important because of its relationship to the "transition" approach mandated by Congressional intent and Title VII legislation. Following the presentation of this finding in Volume I, it became apparent that further clarification of how the Study arrived at this finding would be helpful to those who questioned the finding. What was surprising was the concern of some reviewers over the accuracy of this finding when in fact the projects participating in the Impact Study were openly proud of their maintenance goals, which often included the objective that all children, including the English-monolingual and English-dominant students, become fluent in Spanish as well as in English. This information was elicited through interviews with Title VII project directors. The results of the interviews related to this finding were presented in Volume I. Additional interviews with Title VII teachers and direct observation of Title VII classrooms corroborated this finding. The detailed project goals and procedures for each Impact Study Title VII project were presented in Volume II and further document the project director interview findings. In addition to the analysis of the stated goals of the projects, it was found that the Title VII projects in the Intensive Sample of the Impact Study spent, on the average, about equal amounts of time per week in English Reading/Language Arts and Spanish Reading/Language Arts in the sixth grade, which was the highest grade included in the Study.

In addition to the findings of the Impact Study, other independent studies have found a very high incidence of "maintenance" projects operating under Title VII funding (General Accounting Office, May 1976; Epstein, 1977).

C. Title VII Impact on Student Achievement and Attitudes

This volume examined the results obtained from a third data collection point (fall 1976) on a subsample of second- and third-graders followed into 1976-77 school year, looked into a number of issues related to the fall 1975 to spring 1976 Impact Study findings reported in Volume I, and continued the examination of these Volume I findings. The data collected by the Study were analyzed extensively. Essentially Title VII Impact was analyzed by means of three different comparative approaches:

- Regression analysis and analysis of covariance (ANCOVA)
- Standardized gain score analysis and partial correlation analysis
- Comparison with CTBS national norms

Each analysis was preceded by a number of preliminary analyses that permitted an assessment of whether or not the technique's statistical assumptions were tenable.

Fall 1975 to Fall 1976 Analysis

The analyses of the data from 1975-76 school year second- and third-graders who were followed into the 1976-77 school year showed that the Follow-On and Non-Follow-On Samples differed in several important aspects, and it appeared reasonable to consider the data collected in the fall of 1976 as data from a somewhat different subset of Title VII and Non-Title VII students from those involved in the 1975-76 school year analysis.

- The findings suggest that overall for both the second- and third-grade cohort the fall 1975 to fall 1976 achievement gains in English Reading and Mathematics Computations in Title VII projects were neither significantly nor substantially different from Non-Title VII projects.

- The English Reading percentile rank of the average Title VII Hispanic student in grades 2 and 3 was still considerably below grade level in fall 1976 (approximately 20th percentile rank).
- The Mathematics Computation in fall 1976 was also still below grade level (approximately 30th percentile for the second-graders and 40th percentile for the third-graders).

Further Examination of Fall 1975 to Spring 1976 Data

Following the data collection during the 1975-76 school year, two volumes were prepared which presented analyses and findings related to data collected during that school year. Volume I contained the basic study design and interim findings. Volume II contained detailed project descriptions of the Title VII projects participating in the Impact Study.

Issues. Following the critiques of these documents, additional time and funds were allocated to the Study by the Office of Education to address further some of the issues presented in the critiques as well as those suggested by AIR project staff. Seven issues which might affect the interpretations of Title VII Program Impact were examined, and the results of the analyses were as follows:

Attrition and missing data. Although there were some significant differences across treatment groups in attrition and test omission effects, their effects on the Program impact analyses were generally not substantial. In the few cases where they might be substantial, employing the estimated corrections would have the effect of making Title VII gains appear smaller. Thus, differential attrition and test omissions could not have been the cause of any lack of finding significant benefits from Title VII treatments in terms of gains on CTBS scales.

Time of testing. All the differences between testing times slightly favored the Title VII students, and, if the effects were substantial, they could cast doubt on results showing positive Title VII effects.

Differential guessing rates. Generally, differential guessing effects tend not to have been large; however, in grades 3, 5, and 6 some effects were substantial enough to warrant consideration in reaching conclusions from impact comparisons. In grade 3, Non-Title VII students' gains may have benefited differentially from guessing, while in grades 5 and 6 the gains of Title VII students may have benefited from differential guessing.

Sensitivity of ESL and CTBS Reading tests. When measured from fall to spring, the ESL test appears to be substantially more sensitive to gains than the CTBS Reading test, especially for second-, third-, and sixth-graders. When measured over a full year, from fall to fall, however, there is no consistent difference in sensitivity. In the period between the spring test and the following fall test, student gains for second- and third-graders were apparently more sensitively measured by the CTBS Reading test.

Mixing of in-level and out-of-level tests. The effects are not large because most children in both groups took in-level tests and because the bias was in the same direction for both groups. It appears that only in grade 3 is there any substantial effect; the average estimate of the effect of Title VII on Reading Total and Vocabulary Scores in third grade may underestimate actual gains by 3 to 5 expanded standard score points. However, this effect is not large (about .1 standard deviation). Moreover, it is probably an overestimate of the actual distortion in the impact analyses because some of the in-level/out-of-level variance was undoubtedly partialed out in the ANCOVA and standardized residual gain score analyses.

Number of boys and girls in each treatment. Volume I did not include separate analyses for boys and girls. Because of the relatively large amount of missing data about the sex of the student, an attempt was made to determine the sex of the students for whom sex data was not available on their questionnaires and to examine the possible differences between Title VII and Non-Title VII student populations related to this sex variable. Staff familiar with both Hispanic and non-Hispanic first names examined each of the student names in the Impact Study Sample, and a determination was made whether the name was a boy's or a girl's. The decision was straightforward for almost all of the names. For a few students, the name did not yield adequate information about the student's sex. For these, no sex determination was made. By following the procedures just described, sex determination was made for about 98% of the students in the Sample.

An examination of the proportions of males and females by grades within Title VII With Comparison, Title VII Without Comparison, Title VII Pooled, and Non-Title VII groups revealed an essentially even distribution of males and females within grades and within treatment classification. It seems reasonable, therefore, to assume that sex differences were not associated with treatment classification, and thus no further analyses by sex appeared necessary to assess overall Title VII impact.

Title VII impact. As was the case in the analyses of growth in achievement between fall 1975 and fall 1976, the findings derived from three different analytic methods were also used to "triangulate" on conclusions regarding Program impact between fall 1975 and spring 1976. The methods used to assess Title VII impact on gains from fall 1975 to spring 1976 for Hispanic students were standardized residual gain score analysis, analysis of covariance (ANCOVA), and comparison of pretest and posttest percentile ranks.

In general, the results of the three methods of Title VII impact analysis were supportive of each other. While there were instances of Title VII impact in some subjects in some grades, the overall across-grade Total Title VII student analyses showed that Title VII does not appear to be having a consistent significant impact in meeting its goals as set forth in the legislation. In instances, such as the fourth grade, where Title VII appears to be having a positive impact on English Reading, there was evidence that Title VII teachers were emphasizing the acquisition of English Language Arts skills in their classrooms and were themselves more English dominant. Relative to Title VII classrooms in other grades, in fourth grade Title VII classrooms more time was being allocated to English Language Arts and less time was being allocated to Spanish Language Arts.

In general, across grades when Total Title VII and Non-Title VII comparisons were made, the Title VII students in the Study appear to be doing poorer in English than the Non-Title VII students. In terms of

Mathematics, across grades, they appear to be performing about the same as Non-Title VII students.

Relative to national norms, Title VII Hispanic students, across grades, were performing at about the 20th percentile in English Reading and at about the 30th percentile in Mathematics.

D. Relationship Between Gains in Student Achievement and Attitudes and Instructional Process Variables, Contextual Characteristics, and Teacher and Teacher Aide Characteristics

Instructional Process Variables

Detailed educational treatment data were obtained through interviews and classroom observations for a subsample of the participating Title VII and Non-Title VII Comparison classrooms during the 1975-76 school year. Within the set of Title VII classrooms participating in the Impact Study, half were selected for this intensive analysis. In all, 161 classrooms were selected for intensive analysis, 120 of which were Title VII and 41 of which were Non-Title VII classrooms. All Title VII projects in the Study were represented in this intensive analysis subsample. Since the objective of these process analyses was to assess the effects of various instructional strategies and to discover the more effective strategies for the kinds of students included in the Impact Study Sample, the educational treatments of all the Intensive Sample students were included. *These process analyses should not be viewed as an evaluation of all "bilingual education" processes* since the sample of classrooms participating in the Intensive Sample and in the Impact Study were not chosen to be representative of the universe of classrooms implementing bilingual education practices *but were by mandate of the Study restricted to Title VII Spanish/English bilingual projects and the comparison schools in the Study*. However, because of the wide variety of instructional processes present in participating Title VII and Non-Title VII classrooms, it seems reasonable to assume that these analyses are fairly comprehensive and that they do represent findings that might be generalizable to students such as those involved in the educational processes analyzed.

English Language Arts Educational Processes. The standardized gain score analysis for English Language Arts educational processes did not show a completely consistent pattern for any of the process variables and outcomes across all the grades in the Study (grades 2 through 6). However, for three of the grades (3, 4, and 5), the Extent of Grouping was significantly positively related to gains in one or more of the measures used to assess English proficiency. That is, the greater the grouping and regrouping, the greater the gains. The number of hours per week devoted to English Language Arts instruction was positively related to English proficiency gains in grades 2 and 4, unrelated in grades 3 and 6, and negatively related in grade 5.

Mathematics Educational Processes. The relationships between Mathematics gains and hours per week devoted to Mathematics were the same across grades as those found for English Language Arts. That is, there was a significant positive relationship in grades 2 and 4, a negative relationship in grade 5, and no significant relationship either positive or negative for grades 3 and 6.

While the pattern is not complete across grades, it does appear that the more whole-class instruction there is, the less the Mathematics gains; and the more grouping or individualized instruction, the greater the gains. The positive relationship between Extent of Individualization and Mathematics gains was found in grades 2 and 4. Extent of Group Instruction and Mathematics gains were positively associated in grades 5 and 6, and the negative relationships between Extent of Whole-Class Instruction and Mathematics gains were found in grades 2, 5, and 6.

Spanish Use Permitted in Mathematics Class was positively related to Mathematics gains in grade 2; however, there were no significant relationships between this variable and Mathematics gains at other grade levels.

Spanish Educational Processes. There was a consistent positive relationship between Extent of Grouping and gains in the Spanish as a Second Language test scores across most of the grades (2, 3, 4, and 6); and in grades 5 and 6 the Extent of Grouping was also positively related to the Spanish Reading test.

Average Spanish Hours per Student per Week was positively related to gains in the Spanish as a Second Language scores in grades 2, 3, and 4. There were no significant relationships between Hours per Week and SSL gains in grades 5 and 6. There were no significant relationships in any grade between Hours per Week in Spanish and the Spanish Reading test score gains.

Contextual Characteristics

There was very little consistency across grades in the relationship between the contextual variables--Home and Neighborhood Use of English and Proportion of Hispanic Students in the Classroom--and any of the outcome measures. The greater the Home and Neighborhood Use of English, the lower the gains in the Spanish as a Second Language scores in grades 3 and 4. The greater the Proportion of Hispanic Students in the Classroom, the greater the gains in the Spanish as a Second Language scores in grades 3 and 4.

Teacher and Teacher Aide Characteristics

The relationships between almost all of the characteristics of teachers and teacher aides and student outcome measures did not extend across more than one or two grades; and at times, a given characteristic was positively related with an outcome for one grade and negatively related for the same outcome measure for another grade. Teacher Non-Classroom Use of English was negatively associated with gains in the Spanish Reading test scores in two grades (3 and 4) and positively related to such gains in another grade (5). The opposite pattern was found between Teacher Non-Classroom Use of Spanish and gains in the Spanish Reading test (positively related in grades 3 and 4; negatively related in grade 5). There was no significant relationship between Teacher Non-Classroom Use of English and Teacher Non-Classroom Use of Spanish and Spanish Reading Score gains in the other two grades (2 and 6). Teacher Bilinguality was positively related to the Spanish Reading Score in only one grade; it was negatively related in another grade; and it had no relationship in the other grades.

Gains in Attitude Toward School, Attitude Toward English, and Attitude Toward Spanish were all generally unrelated to any of the Teacher Characteristics, with Teacher Overall Qualifications being unrelated in all grades, Teacher Bilinguality being related to these attitude gains in only one grade, Teacher Non-Classroom Use of English being related in only one grade, and Teacher Non-Classroom Use of Spanish being related in only one grade.

Teacher Characteristics, Teacher Overall Qualifications, Teacher Bilingual Qualifications, and Teacher Bilinguality were generally unrelated to gains in any of the English Reading Score or ESL Score gains. A given characteristic was related to an English Reading outcome gain in only one grade. For all the other grades, there was no significant relationship, either positive or negative.

Aide Bilinguality and Aide Bilingual Teacher Qualifications were also generally unrelated to English Reading Score or ESL Score gains; and the two relationships which were found were both negatively related to gains in grades 2 and 4. The Aide Non-Classroom Use of English and Aide Non-Classroom Use of Spanish (which can be thought of as some indication of the general language use pattern of the individual) each were related in only two grades, and the relationship for each was positive in one grade and negative in the other.

Mathematics Score gains were not related to any of the Teacher/Teacher Aide Characteristics across grades. Again, the relationship between a given characteristic and a Mathematics Score gain was sometimes positive for one grade and negative for another. Teacher Bilinguality was related to Mathematics gains in only one grade (4), and this relationship was negative. Aide Bilinguality was, however, positively related to Mathematics gains in two grades (3 and 5).

While Teacher Characteristics were found to be generally unrelated to gains in any of the attitude measures, Aide Characteristics were found to be positively related to Attitude Toward School gains in three grades (2, 4, and 5). The greater the Aide Non-Classroom Use of Spanish in these grades, generally, the greater the gain in Attitude Toward School.

It thus appears that teacher and teacher aide qualifications (overall and bilingual) and bilinguality characteristics have little relationship to English Reading Score or English as a Second Language Score gains. However, Aides who are more Spanish dominant, as reflected by their non-classroom use of Spanish, have a positive effect on gains in Attitude Toward School in three of the six grade levels in the Study. Teacher qualifications (overall and bilingual) and bilinguality also appear to have little relationship with Mathematics and Attitude Toward School, Attitude Toward English, and Attitude Toward Spanish gains.

APPENDIXES

APPENDIX II-A-1

TRANSFORMATION TO REDUCE HETEROGENEITY OF COVARIANCE

APPENDIX II-A-1

Transformation to Reduce Heterogeneity of Covariance

Heterogeneity of covariance presents a critical problem for the use of ANCOVA. If the relationships between covariates and dependent variables vary between groups, no simple conclusions can be reached concerning mean differences between groups. This is unfortunate for the evaluation of many federal educational programs because the treatments are provided for children whose test scores are initially lower than those of children available for inclusion in control or comparison groups, and the relationships between pretests and posttests tend to be weaker for scores in the lower region of the test range. One reason for this is that scores on multiple-choice tests (which are normally used for program evaluation because of ease of scoring) tend to include a guessing component that is a much larger proportion of observed score variance at the low end of the test range than at the high end. This, coupled with the fact that variance due to guessing is largely unrelated between pretest and posttest, while the variance in true scores is strongly related between pretest and posttest, yields heterogeneity of covariance.

An example of these relationships is shown in Figure 2-A. In this figure, pretest and posttest total reading scores are plotted for second-graders in the Title VII classrooms (for communities with comparison schools). The Title VII scores tend to be lower than Non-Title VII scores on both pretest and posttest, and the linear regression between pretest and posttest tends to be correspondingly weaker (lower slope).

The effect is most noticeable when a substantial proportion of the test scores are not above the guessing level. If all scores are far above the guessing level, (but below the ceiling), knowledge is being measured more reliably by the test, and the distribution of test scores more closely fits the theory of tests underlying ANCOVA and other common parametric statistical methods.

Rather than merely casting aside the data for which regressions are heterogeneous or employing a post-hoc curve-fitting model, as was recently

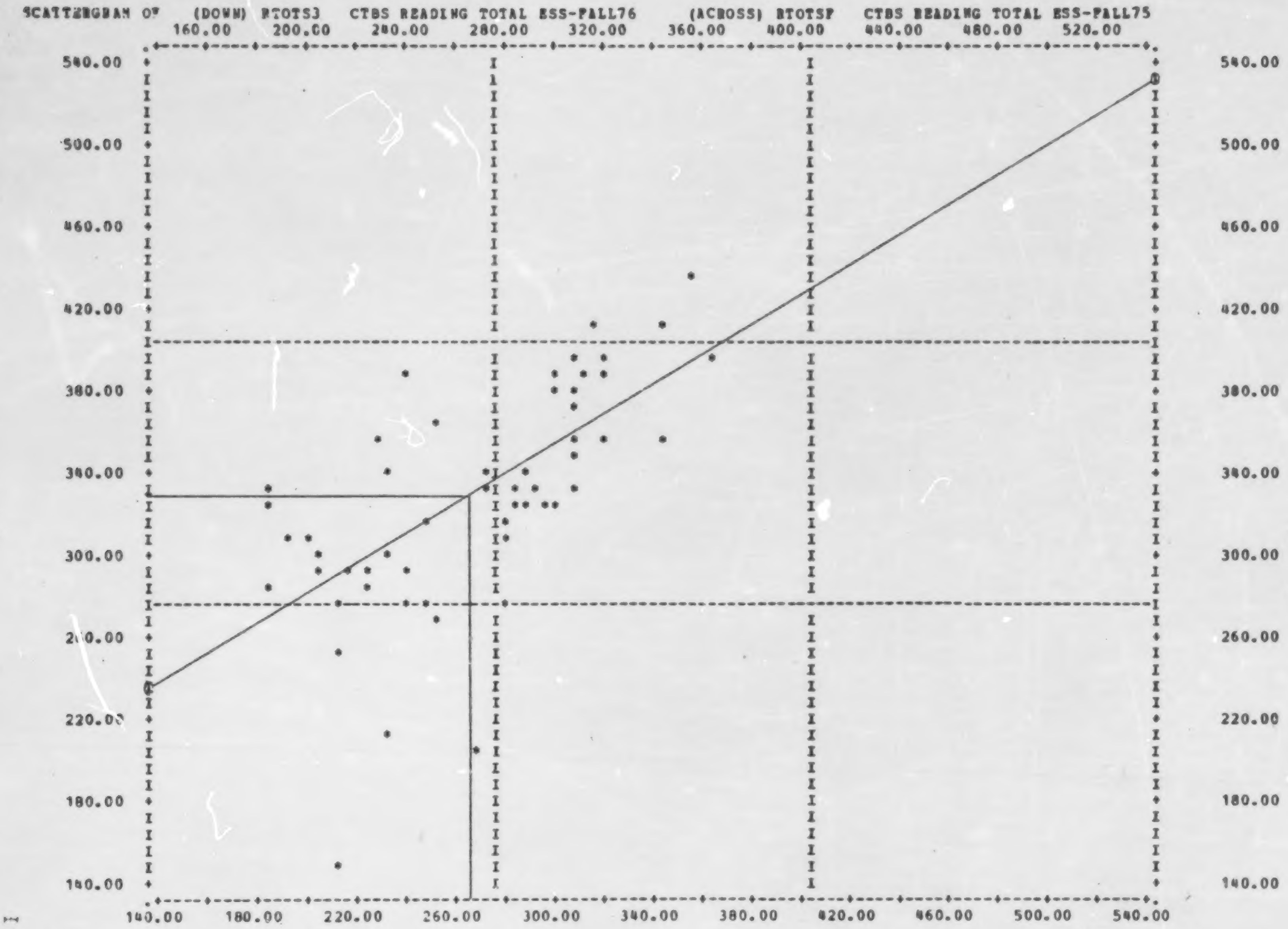


Figure 1-A. Bivariate distribution of untransformed scores, based on second-grade cohort fall 1975 and fall 1976 total Reading expanded scale scores for Non-Title VII classrooms.

done by Trismen et al. (1975) in the Study of Compensatory Reading Programs, the staff of this project have transformed the scores (both pretest and posttest) to reduce this problem when theoretical conditions warranted it. These are the conditions in which the transformation was used:

- The regression slopes (B's) between two groups were somewhat different (significant at the .10 level);
- The regression slope for the group with the lower mean level (on both pretest and posttest) was lower than the slope for the other group, as predicted by the hypothesis that guessing accounts for the heterogeneity of regression slopes;
- At least 10% of the group with the lower mean had scores at or below the chance level of responding.

By limiting the transformation to cases in which it is truly warranted, the authors intended to avoid merely capitalizing on chance.

Transformation of scores is an accepted practice. The expanded scale scores reported from this and other evaluations are themselves transformed scores, and our procedure merely altered that transformation to approximate one of its goals (normalizing the scores) more adequately.

The mathematical form of the transformation is a function of the theory underlying it. The "knowledge" component of the score is assumed to vary from 0 (or the minimum obtainable expanded scale score for the level) to a maximum obtainable score, M, on both pretest and posttest. The actual observed score adds a guessing component to the knowledge component.* If the amount added were directly proportional to the amount of knowledge not known, the data would be distributed as in Figure 2-A, where each straight line is an equiprobability contour. The transformation to render these equiprobability contours into parallel straight lines is of the

---

*The guessing component bears no direct and simple relationship to the "error" score in classical test theory (e.g., it is never negative); however, it is assumed that the accuracy of guessing at pretest is not related to the accuracy of guessing at posttest.

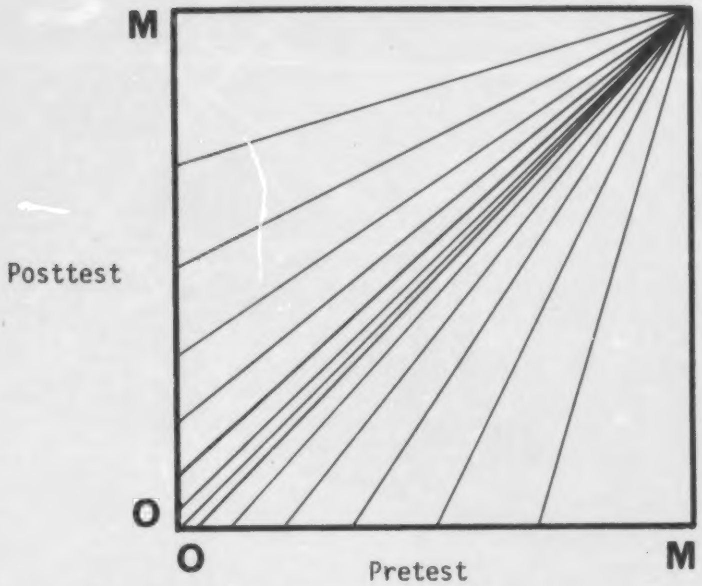


Figure 2-A. Equiprobability contours that are rendered parallel by applying $T(x) = \log(M-x)$ to pretest and posttest scores.

form $T(x) = a \cdot \log(M-x) + b$, for arbitrary a and b. Applying this logarithmic transform to both pretest (x) and posttest (y) yields parallel equiprobability contours, $T(y) = T(x) + k$, if we started with $M-y = C(M-x)$.

This transformation does not appear to be adequate, however. The assumption that the guessing component is proportional to the lack of knowledge a student has is simple and appealing, but no tests of guessing behavior have been performed to verify that relation. In fact, examination of scatterplots from different studies suggests that a further constraint be added: that, at a knowledge score of zero, the observed score be completely unrelated to the knowledge score (slope of zero), and therefore the pretest and posttest scores be unrelated. The simplest set of equiprobability contours in this case would be the quadratic curves, $M^2-Y^2 = C(M^2-X^2)$ shown in Figure 3-A. The transformation to render these equiprobability curves into parallel straight lines is of the form $T(x) = a \cdot \log(M^2-x^2) + b$. This is essentially the transform used in the present study. Two additional refinements were made: (1) zero was replaced by the minimum obtainable expanded scale score on the test form (X min) and (2) M was replaced by M + δ to avoid the necessity of computing the logarithm of ∞. The value of δ was chosen so that M + δ was the next obtainable expanded scale score (on a higher level of the test) higher than a perfect score on the form of the test taken. The values of a and b were selected so that a raw score of zero (X min) would be transformed to zero and the maximum observed score, X ob. max, would be transformed to 100. The transform applied to observed scores was, therefore,

$$T(x) = 100 \frac{\log\left(1 - \frac{(x - X_{min})^2}{(M + \delta - X_{min})^2}\right)}{\log\left(1 - \frac{(x_{ob.max} - X_{min})^2}{(M + \delta - X_{min})^2}\right)}.$$

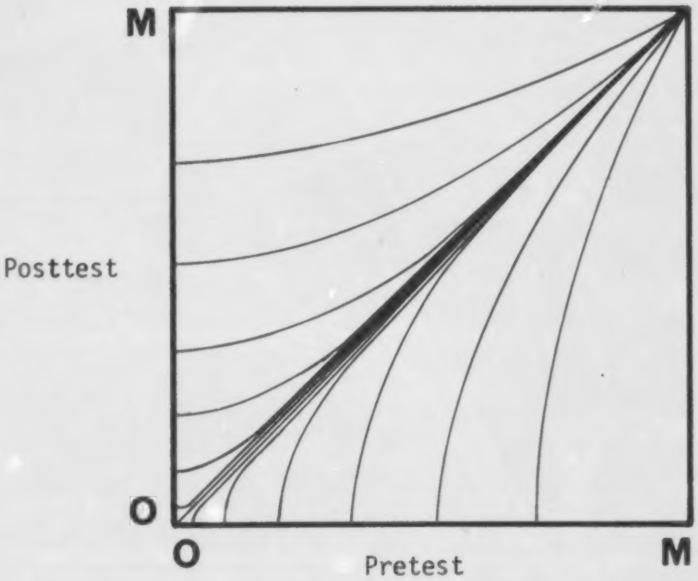


Figure 3-A. Equiprobability contours that are rendered parallel by applying $T(x) = \log(M^2 - x^2)$ to pretest and posttest scores.

The effect of this transformation is to compact the scores at the lower end of the scale on both the pretest and posttest and to expand them at the upper end and thereby to reduce the contribution of guessing variance to the overall bivariate distribution. The transformed scores corresponding to those shown in Figure 1-A are shown in Figure 4-A.

While a great deal of development must be done to understand fully the guessing process in test-taking, the method used here has allowed some conclusions to be reached from the study that otherwise would not have been possible.

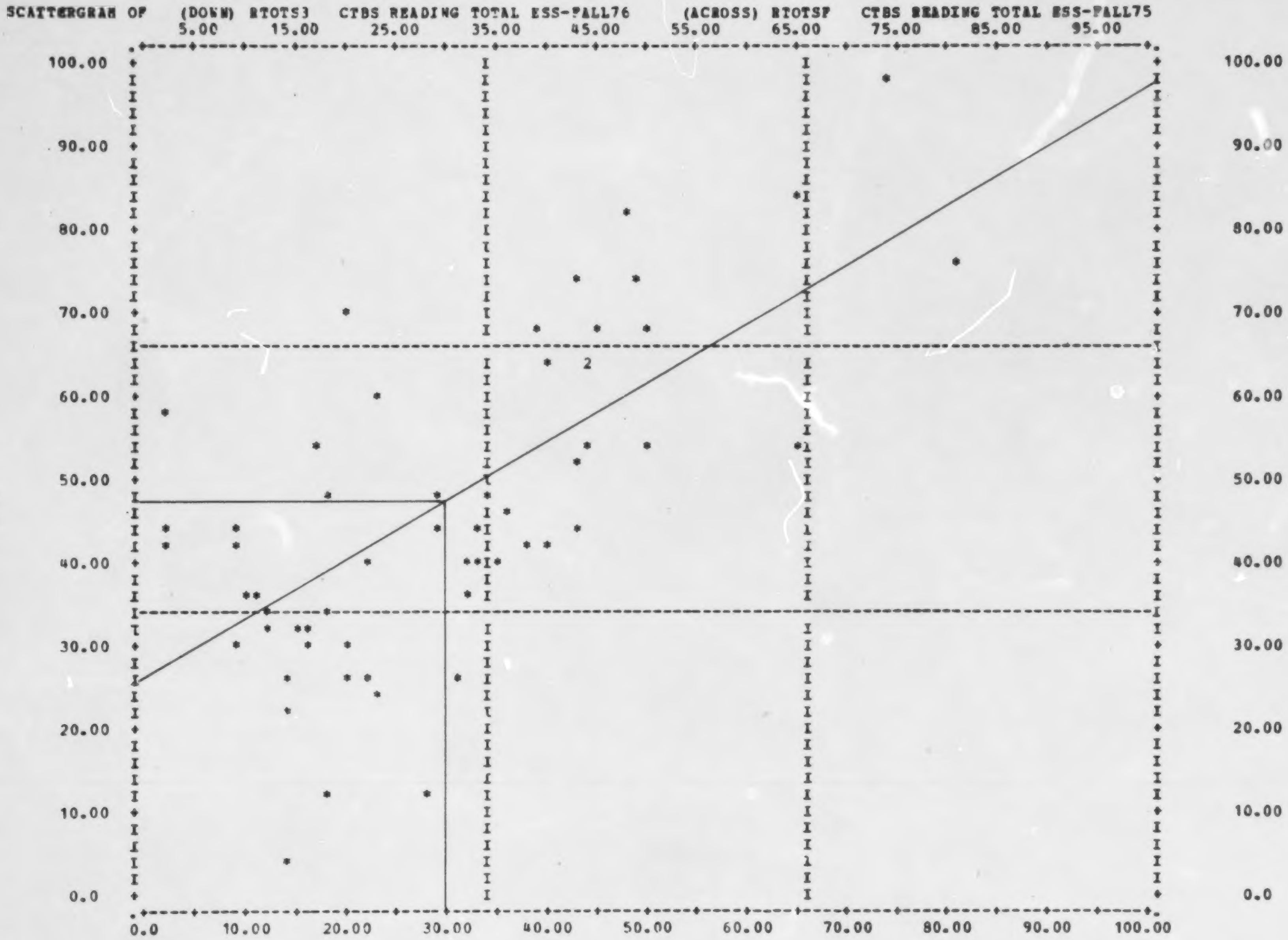


Figure 4-A. Bivariate distribution of transformed scores, based on second-grade cohort fall 1975 and fall 1976 Total Reading expanded scale scores for Non-Title VII classrooms.

APPENDIX II-A-2

BILINGUAL IMPACT STUDY TIME OF TESTING CODE

APPENDIX II-A-2

Bilingual Impact Study Time of Testing Code

Year	Month	Numeric Code
1975	August	1
	September	2
	October	3
	November	4
	December	5
1976	January	6
	February	7
	March	8
	April	9
	May	10
	June	11
	July	12
	August	13
	September	14
	October	15
	November	16
	December	17

APPENDIX II-A-3

SUPPORTING TABLES FOR CHAPTER II, SECTION A

TABLE II-A-3-1a

Comparison of Title VII and Non-Title VII Hispanic Follow-On and Non-Follow-On Students by Geographic Distribution

		Follow-On								Non-Follow-On							
		Grade 2[a]				Grade 3[a]				Grade 2[a]				Grade 3[a]			
		Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII
Northeast	N	69	0	69	0	91	0	91	0	241	125	116	81	253	89	164	75
	%	47.6	0.0	68.3	0.0	54.8	0.0	88.3	0.0	36.1	43.3	30.6	30.7	29.2	14.9	61.2	16.2
South	N	0	0	0	0	15	15	0	0	8	8	0	1	4	4	0	0
	%	0.0	0.0	0.0	0.0	9.0	23.8	0.0	0.0	1.2	2.8	0.0	0.4	0.5	0.7	0.0	0.0
Midwest	N	0	0	0	0	12	0	12	0	5	0	5	0	17	14	3	6
	%	0.0	0.0	0.0	0.0	7.2	0.0	11.7	0.0	0.7	0.0	1.3	0.0	2.0	2.3	1.1	1.3
Southwest	N	49	33	16	43	48	48	0	56	358	126	232	159	470	442	28	357
	%	33.8	75.0	15.8	75.4	28.9	76.2	0.0	100.0	53.6	43.6	61.2	60.2	54.3	74.0	10.4	76.9
West	N	27	11	16	14	0	0	0	0	56	30	26	23	121	48	73	26
	%	18.6	25.0	15.8	24.6	0.0	0.0	0.0	0.0	8.4	10.4	6.9	8.7	14.0	8.0	27.2	5.6
Total	N	145	44	101	57	166	63	103	56	668	289	379	264	865	597	268	464
	%	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

---

[a] 1975-76 school year

TABLE II-A-3-2a

Comparison of Title VII Hispanic Follow-On and Non-Follow-On Students by Hispanic Ethnic Group

		Follow-On								Non-Follow-On							
		Grade 2^a				Grade 3^a				Grade 2^a				Grade 3^a			
		Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII
Central American	N	3	0	3	0	9	6	3	0	18	15	3	3	29	4	25	1
	%	2.1	0.0	3.0	0.0	5.4	9.5	2.9	0.0	2.7	5.2	0.8	1.1	3.4	0.7	9.3	0.2
Cuban	N	1	0	1	0	3	3	0	0	12	8	4	4	11	8	3	0
	%	0.7	0.0	1.0	0.0	1.8	4.8	0.0	0.0	1.8	2.8	1.1	1.5	1.3	1.3	1.1	0.0
Mexican	N	75	43	32	57	45	36	9	56	382	123	259	169	570	496	74	374
	%	51.7	97.7	31.7	100.0	27.1	57.1	8.7	100.0	57.2	42.6	68.3	64.0	65.9	83.1	27.6	80.6
Puerto Rican	N	64	0	64	0	88	1	87	0	198	91	107	71	214	61	153	62
	%	44.1	0.0	63.4	0.0	53.0	1.6	84.5	0.0	29.6	31.5	28.2	26.9	24.7	10.2	57.1	13.4
South American	N	2	1	1	0	9	5	4	0	26	20	6	7	33	25	8	22
	%	1.4	2.3	1.0	0.0	5.4	7.9	3.9	0.0	3.9	6.9	1.6	2.7	3.8	4.2	3.0	4.7
Spanish	N	0	0	0	0	12	12	0	0	32	32	0	10	8	3	5	5
	%	0.0	0.0	0.0	0.0	7.2	19.0	0.0	0.0	4.8	11.1	0.0	3.8	0.9	0.5	1.9	1.1

[a] 1975-76 school year

TABLE II-A-3-3a

Comparison of Title VII and Non-Title VII Hispanic Follow-On and Non-Follow-On Students by Basis for Presence in Title VII Bilingual Classrooms

		Follow-On						Non-Follow-On					
		Grade 2[a]			Grade 3[a]			Grade 2[a]			Grade 3[a]		
		Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison
Spanish Surname	N	5	0	5	1	0	1	51	29	22	64	45	19
	%	3.5	0.0	5.2	0.6	0.0	1.0	7.8	10.1	6.0	7.7	8.1	7.1
Need for English Instruction	N	26	10	16	40	18	22	237	86	151	258	215	43
	%	18.4	22.7	16.5	24.1	28.6	21.4	36.3	29.9	41.4	31.2	38.5	16.0
Parent Request	N	56	11	45	81	17	64	206	124	82	300	125	175
	%	39.7	25.0	46.4	48.8	27.0	62.1	31.5	43.1	22.5	36.3	22.4	65.3
Bilingual	N	22	4	18	17	1	16	49	5	44	98	80	18
	%	15.6	9.1	18.6	10.2	1.6	15.5	7.5	1.7	12.1	11.9	14.3	6.7
Other	N	32	19	13	27	27	0	110	44	66	107	94	13
	%	22.7	43.2	13.4	16.3	42.9	0.0	16.8	15.3	18.1	12.9	16.8	4.9
Missing	N	4	0	4	0	0	0	15	1	14	38	38	0

[a] 1975-76 school year

TABLE II-A-3-4a

Comparison of Title VII and Non-Title VII Hispanic Follow-On and Non-Follow-On Students by First Year in a Continental United States School, 1975-76 School Year

		Follow-On								Non-Follow-On							
		Grade 2[a]				Grade 3[a]				Grade 2[a]				Grade 3[a]			
		Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII
Not First Year in Continental U.S.	N	127	44	83	56	145	57	88	33	601	260	341	256	686	519	167	424
	%	96.9	100.0	95.4	100.0	92.9	90.3	94.6	100.0	97.2	96.7	97.7	99.2	97.4	97.7	96.5	98.1
First Year in Continental U.S.A.	N	4	0	4	0	11	6	5	0	17	9	8	2	18	12	6	8
	%	3.1	0.0	4.6	0.0	7.1	90.5	5.4	0.0	2.8	3.3	2.3	0.8	2.6	2.3	3.5	1.9
Missing Data	N	14	0	14	1	10	0	10	23	50	20	30	6	161	66	95	32

[a] 1975-76 school year

TABLE II-A-3-5a

Comparison of Title VII and Non-Title VII Hispanic Follow-On and Non-Follow-On Students by Years in Bilingual Education

		Follow-On								Non-Follow-On							
		Grade 2[a]				Grade 3[a]				Grade 2[a]				Grade 3[a]			
		Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII
1 Year or less	N	1	0	1	0	9	0	9	7	12	5	7	68	16	11	5	123
	%	0.7	0.0	1.0	0.0	5.4	0.0	8.7	28.0	1.8	1.7	1.8	70.1	1.8	1.8	1.9	84.8
2 Years	N	51	18	33	1	28	10	18	4	174	57	117	29	188	128	60	10
	%	35.2	40.9	32.7	100.0	16.9	15.9	17.5	16.0	26.0	19.7	30.9	29.9	21.7	21.4	22.4	6.9
3 Years	N	40	11	29	0	50	7	43	14	275	153	122	0	249	174	75	12
	%	27.6	25.0	28.7	0.0	30.1	11.1	41.7	56.0	41.2	52.9	32.2	0.0	28.8	29.1	28.0	8.3
4 Years	N	52	15	37	0	70	46	24	0	183	73	110	0	319	246	73	0
	%	35.9	34.1	36.6	0.0	42.2	73.0	23.3	0.0	27.4	25.3	29.0	0.0	36.9	41.2	27.2	0.0
5 Years	N	1	0	1	0	7	0	7	0	24	1	23	0	91	38	53	0
	%	0.7	0.0	1.0	0.0	4.2	0.0	6.8	0.0	3.6	0.3	6.1	0.0	10.5	6.4	19.8	0.0
6 Years	N	0	0	0	0	2	0	2	0	0	0	0	0	2	0	2	0
	%	0.0	0.0	0.0	0.0	1.2	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.7	0.0
Missing	N	0	0	0	56	0	0	0	31	0	0	0	167	0	0	0	319
Total on Which % Based	N	145	44	101	1	166	63	103	25	668	289	379	97	865	597	268	145
Average[b]		3.01	2.93	3.04		3.26	3.571	3.07		3.05	3.02	3.07		3.33	3.29	3.43	

[a] 1975-76 school year

[b] Average calculated assuming "1 year or less" is "1", "1 to 2 years" is "2", etc.

TABLE II-A-3-6a

Age of Hispanic Follow-On and Hispanic Non-Follow-On Students, Grades 2 and 3, 1975-1976 School Year

Follow-On Analysis Group						Non-Follow-On Group					
		Title VII Pooled I	Title VII With Comparison	Title VII Without Comparison	Non-Title VII			Title VII Pooled I	Title VII With Comparison	Title VII Without Comparison	Non-Title VII
Grade		(1)	(2)	(3)	(4)	Grade		(5)	(6)	(7)	(8)
2	x̄	7.37[a*]	7.38	7.36	7.19[a*]	2	x̄	7.36	7.37	7.35	7.31
	n	142	42	100	56		n	659	286	373	247
	std dev	0.60	0.70	0.56	0.47		std dev	0.65	0.67	0.65	0.67
3	x̄	8.38	8.52[b*]	8.29[b*]	8.54	3	x̄	8.40	8.44	8.32	8.48
	n	165	63	102	56		n	863	596	267	460
	std dev	0.67	0.69	0.64	0.74		std dev	0.61	0.64	0.52	0.69

Groups which were significantly different:
[a] Columns 1 and 4
[b] Columns 2 and 3
[c] Columns 2 and 4
[d] Columns 1 and 5
[e] Columns 2 and 6
[f] Columns 3 and 7
[g] Columns 4 and 8

Level of significance:
$*p \leq .05$
$**p \leq .02$
$***p \leq .01$
$****p \leq .002$

TABLE II-A-3-7a

Socioeconomic Status of Hispanic Follow-On and Hispanic Non-Follow-On Students--Grades 2 and 3, 1975-1976 School Year

Follow-On Analysis Group						Non-Follow-On Group					
		Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII			Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII
Grade		(1)	(2)	(3)	(4)	Grade		(5)	(6)	(7)	(8)
2	$\bar{x}$	5.35^{d****}	5.06^{e*}	5.48^{f****}	4.72	2	$\bar{x}$	4.31^{d****}	4.26^{e*}	4.34^{f****}	4.81
	n	145	44	101	57		n	668	289	379	264
	std dev	2.67	2.37	2.79	2.24		std dev	2.09	2.08	2.10	2.28
3	$\bar{x}$	4.89^{a**}	4.86	4.90^{f*}	4.26^{a**}	3	$\bar{x}$	5.03	4.82	5.50^{f*}	4.73
	n	166	63	103	56		n	865	597	268	464
	std dev	1.60	1.76	1.50	1.94		std dev	2.40	2.26	2.61	2.23

Groups which were significantly different:
^{a}Columns 1 and 4
^{b}Columns 2 and 3
^{c}Columns 2 and 4
^{d}Columns 1 and 5
^{e}Columns 2 and 6
^{f}Columns 3 and 7
^{g}Columns 4 and 8

Level of significance:
$*p \leq .05$
$**p \leq .02$
$***p \leq .01$
$****p \leq .002$

TABLE II-A-3-8a

Number of School Days Absent Between Fall 1975 and Spring 1976 Test Dates--Hispanic Follow-On and Hispanic Non-Follow-On Students, Grades 2 and 3

Follow-On Analysis Group						Non-Follow-On Group					
		Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII			Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII
Grade		(1)	(2)	(3)	(4)	Grade		(5)	(6)	(7)	(8)
2	$\bar{x}$	11.4^{a*}	9.6	12.0	8.4^{a*g*}	2	$\bar{x}$	12.0	12.5	11.6	11.0^{g*}
	n	111	27	84	56		n	581	258	323	257
	std dev	9.7	5.3	10.7	7.1		std dev	11.2	10.9	11.5	9.0
3	$\bar{x}$	10.5^{a*}	8.1^{b***}	12.3^{b***}	6.4^{a*}	3	$\bar{x}$	10.8	9.7	13.7	8.4
	n	144	63	81	24		n	628	454	174	447
	std dev	9.3	6.9	10.5	7.0		std dev	11.1	10.7	11.6	7.6

Groups which were significantly different:
- [a] Columns 1 and 4
- [b] Columns 2 and 3
- [c] Columns 2 and 4
- [d] Columns 1 and 5
- [e] Columns 2 and 6
- [f] Columns 3 and 7
- [g] Columns 4 and 8

Level of significance:
- $*p \leq .05$
- $**p \leq .02$
- $***p \leq .01$
- $****p \leq .002$

TABLE II-A-3-9a

Comparison of Title VII and Non-Title VII Hispanic Follow-On and Non-Follow-On Students by Teacher Assessment of Student Language Ability

		Follow-On								Non-Follow-On							
		Grade 2[a]				Grade 3[a]				Grade 2[a]				Grade 3[a]			
		Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII	Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII
Monolingual Spanish Speaker	N	27	10	17	1	40	12	28	0	163	96	67	15	116	68	48	22
	%	18.9	23.3	17.0	1.8	26.0	19.4	30.4	0.0	25.0	33.4	18.4	5.9	13.7	11.6	18.5	4.9
Bilingual English/Spanish Speaker	N	106	31	75	50	106	49	57	54	460	173	287	222	676	490	186	409
	%	74.1	72.1	75.0	87.7	68.8	79.0	62.0	96.4	70.6	60.3	78.6	87.7	79.9	83.6	71.5	90.9
Monolingual English Speaker	N	10	2	8	6	8	1	7	2	29	18	11	16	54	28	26	19
	%	7.0	4.7	8.0	10.5	5.2	1.6	7.6	3.6	4.4	6.3	3.0	6.3	6.4	4.8	10.0	4.2
Missing	N	2	1	1	0	12	1	11	0	16	2	14	11	19	11	8	14
Total on Which % Based	N	143	43	100	57	154	62	92	56	652	287	365	253	846	586	260	450

[a] 1975-76 school year

TABLE II-A-3-10a

Students' Own Assessment of Student Proficiency in Understanding and Speaking English as of Spring 1976--Hispanic Follow-On and Hispanic Non-Follow-On Students

Follow-On Analysis Group						Non-Follow-On Group					
		Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII			Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII
Grade		(1)	(2)	(3)	(4)	Grade		(5)	(6)	(7)	(8)
2	$\bar{x}$	25.0^{a***}	25.2^{c*}	24.9	27.6^{a***c*}	2	$\bar{x}$	25.0	25.0	25.0	27.2
	n	136	40	96	53		n	619	263	356	246
	std dev	5.8	5.8	5.9	4.5		std dev	6.2	6.3	6.1	5.2
3	$\bar{x}$	25.8	27.1^{b*}	25.1^{b*f***}	26.4	3	$\bar{x}$	26.4	26.1	26.9^{f***}	26.9
	n	162	63	99	55		n	816	567	249	446
	std dev	5.9	4.7	6.4	4.6		std dev	5.1	5.0	5.2	4.9

Groups which were significantly different:
- [a] Columns 1 and 4
- [b] Columns 2 and 3
- [c] Columns 2 and 4
- [d] Columns 1 and 5
- [e] Columns 2 and 6
- [f] Columns 3 and 7
- [g] Columns 4 and 8

Level of significance:
- $*p \leq .05$
- $**p \leq .02$
- $***p \leq .01$
- $****p \leq .002$

TABLE II-A-3-11a

Students' Own Assessment of Student Proficiency in Understanding and Speaking Spanish as of Spring, 1976--Hispanic Follow-On and Hispanic Non-Follow-On Students

		Follow-On Analysis Group						Non-Follow-On Group			
		Title VII Pooled	Title VII With Comparison	Title VII Without Comparison	Non-Title VII			Title VII Pooled I	Title VII With Comparison	Title VII Without Comparison	Non-Title VII
Grade		(1)	(2)	(3)	(4)	Grade		(5)	(6)	(7)	(8)
2	x̄	26.7	27.6	26.4	25.5	2	x̄	25.9	26.5	25.5	24.7
	n	136	40	96	53		n	620	264	356	246
	std dev	5.4	4.4	5.8	6.1		std dev	5.8	5.4	6.0	6.4
3	x̄	27.3[a****]	26.9[c*]	27.6	24.3[a****c*]	3	x̄	26.6	26.6	26.7	25.6
	n	162	63	99	55		n	816	567	249	447
	std dev	4.9	4.9	4.9	7.1		std dev	5.0	4.8	5.5	5.8

Groups which were significantly different:
[a] Columns 1 and 4
[b] Columns 2 and 3
[c] Columns 2 and 4
[d] Columns 1 and 5
[e] Columns 2 and 6
[f] Columns 3 and 7
[g] Columns 4 and 8

Level of significance:
$*p \leq .05$
$**p \leq .02$
$***p \leq .01$
$****p \leq .002$

TABLE II-A-3-12a

Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students-- Fall 1975 to Fall 1976 CTBS Reading Total Score Analysis, Cohort 2

				Non-Title VII			Title VII								
							Sites With Identified Comparisons			Sites Without Identified Comparisons			Total Title VII		
Variable	Form/ Level	Time of School Year	Time of Testing of Norm Sample	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]
CTBS Reading Total Score															
Mean	S/C	Fall 75	3.26	266.7	4.92	1.66	234.8	4.67	1.41	246.7	4.36	1.10	242.3	4.47	1.21
S.D.				47.9	.34		43.6	.43		41.1	.46		42.2	.47	
N				54	54		39	39		68	68		107	107	
Mean	S/C	Spring 76	9.26	302.9	10.09	.83	255.7	9.86	0.60	280.9	10.35	1.09	271.7	10.17	0.91
S.D.				43.6	.32		48.9	.46		57.1	.76		55.4	.71	
N				54	54		39	39		68	68		107	107	
Mean	S/1	Fall 76	15.26	330.0	17.20	1.94	285.4	17.37	2.11	300.8	17.01	1.75	295.2	17.14	1.88
S.D.				54.5	.48		49.0	.40		53.9	.38		52.5	.43	
N				54	54		39	39		68	68		107	107	
Socioeconomic Status															
Mean				4.8			5.0			5.3			5.2		
S.D.				2.2			2.4			2.8			2.6		
N				54			39			68			107		
No. of School Days-Fall 1975 to Fall 1976															
Mean				188.8			198.1			204.7			202.3		
S.D.				12.1			9.5			14.4			13.1		
N				54			39			68			107		

TABLE II-A-3-13a

Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students-- Fall 1975 to Fall 1976 CTBS Reading Total Score (Rescored) Analysis, Cohort 2

				Non-Title VII			Title VII								
							Sites With Identified Comparisons			Sites Without Identified Comparisons			Total Title VII		
Variable	Form/ Level	Time of School Year	Time of Testing of Norm Sample	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]
CTBS Reading Total Score (Rescored)															
Mean	S/C	Fall 75	3.26	263.12	4.90	1.64	230.5	4.63	1.37	240.9	4.39	1.13	237.0	4.48	1.22
SD				51.8	.35		49.7	.43		46.4	.48		47.7	.47	
N				56	56		43	43		73	73		116	116	
Mean	S/C	Spring 76	9.26	302.8	10.07	.81	253.1	9.82	0.56	274.7	10.37	1.11	266.7	10.16	0.90
SD				42.9	.32		49.6	.47		63.5	.75		59.4	.71	
N				56	56		43	43		73	73		116	116	
Mean	S/1	Fall 76	15.26	330.7	17.19	1.93	282.4	17.33	2.07	296.5	17.00	1.74	291.3	17.12	1.86
SD				53.7	.48		48.7	.43		55.5	.39		53.3	.43	
N				56	56		43	43		73	73		116	116	
Socioeconomic Status															
Mean				4.8			5.1			5.3			5.3		
SD				2.2			2.4			2.8			2.6		
N				56			43			73			116		
No. of School Days Fall 75 to Fall 76															
Mean				189.1			197.9			204.1			201.8		
SD				11.9			9.5			14.6			13.2		
N				56			43			73			116		

TABLE II-A-3-14a

Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students-- Fall 1975 to Fall 1976 CTBS Reading Vocabulary Score Analysis, Cohort 2

				Non-Title VII			Title VII								
							Sites With Identified Comparisons			Sites Without Identified Comparisons			Total Title VII		
Variable	Form/ Level	Time of School Year	Time of Testing of Norm Sample	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]
CTBS Reading Vocabulary Score															
Mean	S/C	Fall 75	3.26	269.7	4.90	1.64	238.9	4.64	1.38	247.2	4.39	1.13	244.1	4.49	1.23
SD				44.6	.35		47.5	.44		44.2	.48		45.5	.48	
N				56	56		44	44		73	73		117	117	
Mean	S/C	Spring 76	9.26	307.7	10.07	.81	260.3	9.83	.57	283.0	10.37	1.11	274.5	10.16	0.90
SD				44.2	.32		48.9	.47		59.1	.75		56.3	.71	
N				56	56		44	44		73	73		117	117	
Mean	S/1	Fall 76	15.26	332.1	17.19	1.93	294.4	17.33	2.07	301.5	17.00	1.74	298.8	17.12	1.86
SD				52.1	.48		42.3	.43		55.[illegible]	.39		50.9	.43	
N				56	56		44	44		73	73		117	117	
Socioeconomic Status															
Mean				4.8			5.1			5.3			5.2		
SD				2.2			2.4			2.8			2.6		
N				56			44			73			117		
Number of School Days Fall 75 to Fall 76															
Mean				189.1			197.7			204.1			201.7		
SD				11.9			9.4			14.6			13.2		
N				56			44			73			117		

TABLE II-A-3-15a

Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students--Fall 1975 to Fall 1976 CTBS Mathematics Computation Score Analysis, Cohort 2

				Non-Title VII			Title VII								
							Sites With Identified Comparisons			Sites Without Identified Comparisons			Total Title VII		
Variable	Form/ Level	Time of School Year	Time of Testing of Norm Sample	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]
CTBS Mathematics Computation Score															
Mean	S/C	Fall 75	3.26	276.7	4.90	1.64	253.7	4.63	1.37	255.4	4.44	1.18	254.9	4.50	1.24
SD				24.6	.35		23.6	.43		32.5	.43		30.0	.44	
N				53	53		40	40		93	93		133	133	
Mean	S/C	Spring 76	9.26	304.9	10.08	.82	286.3	9.82	0.56	299.7	10.42	1.16	295.7	10.24	.98
SD				29.2	.32		32.0	.46		39.7	.68		37.9	.68	
N				53	53		40	40		93	93		133	133	
Mean	S/1	Fall 76	15.26	338.8	17.21	1.95	297.3	17.33	2.07	315.0	16.95	1.69	309.7	17.07	1.81
SD				43.2	.47		38.2	.42		43.3	.40		42.5	.44	
N				53	53		40	40		93	93		133	133	
Socioeconomic Status															
Mean				4.7			5.1			5.5			5.4		
SD				2.3			2.4			2.8			2.7		
N				53			40			93			133		
Number of School Days															
Mean				189.4			198.0			203.9			202.1		
SD				11.8			9.4			13.4			12.6		
N				53			40			93			133		

TABLE II-A-3-16a

Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students--Fall 1975 to Fall 1976 Prueba de Lectura (Spanish Reading) Total Score Analysis, Cohort 2

				Non-Title VII			Title VII								
							Sites With Identified Comparisons			Sites Without Identified Comparisons			Total Title VII		
Variable	Form/ Level	Time of School Year	Time of Testing of Norm Sample	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]
Prueba de Lectura (Spanish Reading) Total Score															
Mean	A 1	Fall 75	N.A.	20.0	4.43	N.A.	18.0	4.97	N.A.	22.2	4.56	N.A.	21.1	4.67	N.A.
SD				0	0		6.7	.36		9.6	.38		9.1	.42	
N				1	1		20	20		54	54		74	74	
Mean	A 1	Spring 76	N.A.	14.0	9.69	N.A.	16.2	10.18	N.A.	27.9	10.48	N.A.	24.[illegible]	10.40	N.A.
SD				0	0		5.0	.33		13.1	.62		12.6	.57	
N				1	1		20	20		54	54		74	74	
Mean	A 1	Fall 76	N.A.	17.0	17.75	N.A.	18.9	17.52	N.A.	28.4	16.91	N.A.	25.8	17.07	N.A.
SD				0	0		6.8	.19		12.3	.38		11.8	.44	
N				1	1		20	20		54	54		74	74	
Socioeconomic Status															
Mean				5.7			4.3			5.3			5.0		
SD				0			1.7			3.0			2.7		
N				1			20			54			74		
Number of School Days															
Mean				211.8			195.0			201.4			199.6		
SD				0			8.8			12.7			12.1		
N				1			20			54			74		

TABLE II-A-3-17a

Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students--Fall 1975 to Fall 1976 Prueba de Comprensión Auditiva Inglés (English as a Second Language [ESL]) Total Score Analysis, Cohort 2

				Non-Title VII			Title VII								
							Sites With Identified Comparisons			Sites Without Identified Comparisons			Total Title VII		
Variable	Form/ Level	Time of School Year	Time of Testing of Norm Sample	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]
ESL Total Score															
Mean	2	Fall 75	N.A.	569.0	4.43		548.7	4.40		558.2	4.50		556.1	4.48	
SD				0	0		8.6	.08		11.2	.37		11.3	.33	
N				1	1		10	10		35	35		45	45	
Mean	2	Spring 76	N.A.	573.0	9.69		560.4	9.64		567.3	10.60		565.8	10.38	
SD				0	0		8.4	.15		6.2	.47		7.3	.58	
N				1	1		10	10		35	35		45	45	
Mean		Fall 76	N.A.	567.0	17.75		570.6	17.65		570.5	16.99		570.6	17.14	
SD				0	0		5.9	.32		5.5	.40		5.6	.47	
N				1	1		10	10		35	35		45	45	
Socioeconomic Status															
Mean				5.7			3.5			5.1			4.7		
SD				0			2.2			2.9			2.8		
N				1			10			35			45		
Number of School Days															
Mean				211.8			210.1			205.5			206.6		
SD				0			5.3			11.9			10.9		
N				1			10			35			45		

TABLE II-A-3-18a

Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students-- Fall 1975 to Fall 1976 CTBS Reading Total Score Analysis, Cohort 3

				Non-Title VII			Title VII								
							Sites With Identified Comparisons			Sites Without Identified Comparisons			Total Title VII		
Variable	Form/ Level	Time School Year	Time of Testing of Norm Sample	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]
CTBS Reading Total Score															
Mean	S/1	Fall 75	3.26	284.1	4.55	1.29	299.1	4.47	1.21	268.5	4.28	1.02	284.5	4.38	1.12
SD				40.7	.07		49.9	.03		51.5	.31		52.7	.23	
N				55	55		59	59		54	54		113	113	
Mean	T/1	Spring 76	9.26	315.0	10.17	.91	332.7	10.06	.80	295.6	10.75	1.49	315.0	10.39	1.13
SD				55.1	.23		89.7	.27		52.2	.55		76.1	55	
N				55	55		59	59		54	54		113	113	
Mean	S/1	Fall 76	15.26	322.7	16.71	1.45	339.5	16.94	1.68	314.3	17.26	2.00	327.4	17.09	1.83
SD				57.8	.28		56.1	.61		49.5	.27		54.3	.50	
N				55	55		59	59		54	54		113	113	
Socioeconomic Status															
Mean				4.2			4.8			4.5			4.7		
SD				1.9			1.8			1.4			1.6		
N				55			59			54			113		
Number of School Days															
Mean				187.1			193.9			211.9			202.5		
SD				3.9			13.2			8.8			14.5		
N				55			59			54			113		

TABLE II-A-3-19a

Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students--Fall 1975 to Fall 1976 CTBS Reading Total Score (Rescored) Analysis, Cohort 3

				Non-Title VII			Title VII								
							Sites With Identified Comparisons			Sites Without Identified Comparisons			Total Title VII		
Variable	Form/ Level	Time of School Year	Time of Testing of Norm Sample	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]
CTBS Reading Total Score (Rescored)															
Mean	S/1	Fall 75	3.26	284.1	4.55	1.29	299.1	4.47	1.21	257.5	4.41	1.15	277.4	4.44	1.18
SD				40.7	.07		49.9	.03		56.5	.43		57.1	.31	
N				55	55		59	59		64	64		123	123	
Mean	T/1	Spring 76	9.26	315.0	10.17	.91	332.7	10.06	.80	287.3	10.76	1.50	309.0	10.43	1.17
SD				55.1	.23		89.7	.27		59.3	.51		78.5	.54	
N				55	55		59	59		64	64		123	123	
Mean	S/1	Fall 76	15.26	322.7	16.71	1.45	339.5	16.94	1.68	300.9	17.13	1.87	319.4	17.04	1.78
SD				57.8	.28		56.1	.61		64.4	.41		63.3	.52	
N				55	55		59	59		64	64		123	123	
Socioeconomic Status															
Mean				4.2			4.8			4.4			4.6		
SD				1.9			1.8			1.3			1.6		
N				55			59			64			123		
Number of School Days															
Mean				187.1			193.9			207.3			200.9		
SD				3.9			13.2			14.4			15.3		
N				55			59			64			123		

TABLE II-A-3-20a

Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students-- Fall 1975 to Fall 1976 CTBS Reading Vocabulary Score Analysis, Cohort 3

				Non-Title VII			Title VII								
							Sites With Identified Comparisons			Sites Without Identified Comparisons			Total Title VII		
Variable	Form/ Level	Time of School Year	Time of Testing of Norm Sample	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Differ- ence[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Differ- ence[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Differ- ence[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Differ- ence[a]
CTBS Reading Vocabulary Score															
Mean	S/1	Fall 75	3.26	292.8	4.55	1.29	301.4	4.47	1.21	268.7	4.41	1.15	284.4	4.44	1.18
SD				41.8	.07		50.3	.03		53.1	.43		54.1	.31	
N				55	55		59	59		64	64		123	123	
Mean	T/1	Spring 76	9.26	320.4	10.17	.91	322.9	10.06	.80	294.5	10.76	1.50	312.9	10.43	1.17
SD				61.4	.23		88.7	.27		57.2	.51		76.1	.54	
N				55	55		59	59		64	64		123.0	123	
Mean	S/1	Fall 75	15.26	329.2	16.71	1.45	338.6	16.94	1.68	310.9	17.13	1.87	324.2	17.04	1.78
SD				57.7	.28		58.7	.61		63.7	.41		62.6	.52	
N				55	55		59	59		64	64		123	123	
Socioeconomic Status															
Mean				4.2			4.8			4.4			4.6		
SD				1.9			1.8			1.3			1.6		
N				55			59			64			123		
Number of School Days															
Mean				187.1			193.9			207.3			200.9		
SD				3.9			13.2			14.4			15.3		
N				55			59			64			123		

TABLE II-A-3-21a

Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students-- Fall 1975 to Fall 1976 CTBS Mathematics Computation Score Analysis, Cohort 3

				Non-Title VII			Title VII								
							Sites With Identified Comparisons			Sites Without Identified Comparisons			Total Title VII		
Variable	Form/ Level	Time of School Year	Time of Testing of Norm Sample	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]
CTBS Mathematics Computation Score															
Mean	S/1	Fall 75	3.26	314.3	4.55	1.29	322.5	4.47	1.21	295.2	4.43	1.17	305.3	4.45	1.19
SD				35.1	.06		33.9	.03		29.8	.36		34.0	.29	
N				55	55		56	56		95	95		151	151	
Mean	S/1	Spring 76	9.26	353.2	10.18	.92	369.1	10.08	.82	349.8	10.68	1.42	357.0	10.45	1.19
SD				40.8	.23		39.0	.28		38.4	.47		39.6	.50	
N				55	55		56	56		95	95		151	151	
Mean	S/1	Fall 76	15.26	359.2	16.70	1.44	370.4	16.93	1.67	359.9	16.97	1.71	363.8	16.96	1.7
SD				39.8	.28		40.5	.65		39.0	.42		39.7	.51	
N				55	55		56	56		95	95		151	151	
Socioeconomic Status															
Mean				4.3			4.9			4.9			4.9		
SD				1.9			1.8			1.5			1.6		
N				55			56			95			151		
Number of School Days															
Mean				187.0			193.7			204.9			200.8		
SD				3.8			14.0			12.5			14.1		
N				55			56			95			151		

TABLE II-A-3-22a

Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students-- Fall 1975 to Fall 1976 CTBS Prueba de Lectura (Spanish Reading) Total Score Analysis, Cohort 3

				Non-Title VII			Title VII								
							Sites With Identified Comparisons			Sites Without Identified Comparisons			Total Title VII		
Variable	Form/ Level	Time of School Year	Time of Testing of Norm Sample	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference^a	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference^a	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference^a	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference^a
Prueba de Lectura (Spanish Reading) Total Score															
Mean	A/1	Fall 75	N.A.				28.1	4.48	N.A.	26.2	4.39	N.A.	26.8	4.42	N.A.
SD							11.8	.0[illegible]		10.9	.48		11.2	.39	
N							24	24		46	46		70	70	
Mean	A/1	Spring 76	N.A.				33.5	10.12	N.A.	35.3	10.73	N.A.	34.7	10.52	N.A.
SD							12.9	.17		12.7	.46		12.7	.48	
N							24	24		46	46		70	70	
Mean	A/1	Fall 76	N.A.				35.3	16.58	N.A.	33.1	16.93	N.A.	33.9	16.81	N.A.
SD							13.1	.31		13.3	.40		13.2	.41	
N							24	24		46	46		70	70	
Socioeconomic Status															
Mean							5.3			4.9			5.0		
SD							1.6			1.5			1.6		
N							24			46			70		
Number of School Days															
Mean							187.0			204.9			198.8		
SD							5.5			15.1			15.2		
N							24			46			70		

TABLE II-A-3-23a

Test Score and Covariate Means, Standard Deviations and Numbers of Hispanic Students-- Prueba de Comprensión Auditiva Inglés (English as a Second Language [ESL]) Total Score Analysis, Cohort 3

				Non-Title VII			Title VII								
							Sites With Identified Comparisons			Sites Without Identified Comparisons			Total Title VII		
Variable	Form/ Level	Time of School Year	Time of Testing of Norm Sample	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]	Expanded Standard Score	Time of Testing	Test Date/ Norm Date Difference[a]
ESL Total Score															
Mean	2	Fall	N.A.				554.9	4.48		553.0	4.56		553.3	4.55	
SD							10.4	.02		13.9	.33		13.4	.31	
N							7	7		47	47		54	54	
Mean							556.9	10.22		568.7	10.74		568.5	10.67	
SD							5.7	.23		9.1	.54		8.8	.53	
N							7	7		47	47		54	54	
Mean							573.6	16.69		571.7	16.96		571.9	16.93	
SD							4.0	.23		6.7	.46		6.4	.44	
N							7	7		47	47		54	54	
Socioeconomic Status															
Mean							4.8			4.9			4.91		
SD							2.7			1.3			1.5		
N							7			47			54		
Number of School Days															
Mean							187.4			202.2			200.3		
SD							5.4			13.6			13.7		
N							7			47			54		

TABLE II-A-3-24a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score--Grade 2 Hispanic Students, Fall 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores			Transformed Scores		
		Proportion of Variance	F^b	(df)	Proportion of Variance	F^b	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.013	0.75	3,85	.007		
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.076	13.43**** (-)	1,88	.055		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.028	2.60*	3,149	.016	1.77	3,149
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.001			.002	0.70	1,152
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.014			.009	0.94	3,153
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.034			.031	10.28*** (-)	1,156
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Non-Title VII, but same slopes for Title VII With Comparison and Title VII Without Comparison	.015			.010	1.05	3,152
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII Without Comparison and Non-Title VII (ANCOVA)	.025			.021	6.94*** (-)	1,155
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Non-Title VII (ANCOVA)	.029			.029	9.30*** (-)	

[a] The direction is "+" if the difference favors the treatment group named first in the lefthand column; it is "-" if the difference favors the other treatment group compared.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

[b] The F statistic is omitted when the assumptions of the test are violated; for transformed scores, it is also omitted when the transformation is not needed.

TABLE II-A-3-25a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score (Rescored)--Grade 2 Hispanic Students, Fall 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores			Transformed Scores		
		Proportion of Variance	F^b	(df)	Proportion of Variance	F^b	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.029	1.68	3,91	.007		
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.124	21.12**** (-)	1,94	.079		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.050	4.93***	3,160	.020	2.38*	3,160
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.003			.003		
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non Title VII	.023			.010		
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.049			.040		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Non-Title VII, but same slopes for Title VII With Comparison and Title VII Without Comparison	.025			.011		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII Without Comparison and Non-Title VII (ANCOVA)	.035			.027		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Non-Title VII (ANCOVA)	.043			.038		

[a] The direction is "+" if the difference favors the treatment group named first in the lefthand column; it is "-" if the difference favors the other treatment group compared.

* p < .10
** p < .05
*** p < .01
**** p < .001

[b] The F statistic is omitted when the assumptions of the test are violated; for transformed scores, it is also omitted when the transformation is not needed.

TABLE II-A-3-26a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Vocabulary Expanded Standard Score--Grade 2 Hispanic Students, Fall 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores			Transformed Scores		
		Proportion of Variance	F^b	(df)	Proportion of Variance	F^b	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.066	3.91**	3,92	.045	3.31**	3,92
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.064			.069		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.051	5.23***	3,161	.036	3.77**	3,161
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.001			.004		
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.027			.016		
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.022			.028		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Non-Title VII, but same slopes for Title VII With Comparison and Title VII Without Comparison	.027			.018		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII Without Comparison and Non-Title VII (ANCOVA)	.018			.017		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Non-Title VII (ANCOVA)	.016			.028		

[a] The direction is "+" if the difference favors the treatment group named first in the lefthand column; it is "-" if the difference favors the other treatment group compared.

[b] The F statistic is omitted when the assumptions of the test are violated; for transformed scores, it is also omitted when the transformation is not needed.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-A-3-27a

Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Computation Expanded Standard Score--Grade 2 Hispanic Students, Fall 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores			Transformed Scores		
		Proportion of Variance	F^b	(df)	Proportion of Variance	F^b	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.014	0.71	3,85	.007		
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.082	12.72**** (-)	1,88	.066		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.013	1.43	3,174	.016	1.56	3,174
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.015	5.10** (-)	1,177	.006	1.64	1,177
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.020			.018	1.71	3,178
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.024			.022	6.14** (-)	1,181
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Non-Title VII, but same slopes for Title VII With Comparison and Title VII Without Comparison	.023	2.51*	3,177	.018	1.75	3,177
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII Without Comparison and Non-Title VII (ANCOVA)	.011			.013	3.61* (-)	1,180
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Non-Title VII (ANCOVA)	.036			.027	7.56*** (-)	1,180

[a] The direction is "+" if the difference favors the treatment group named first in the lefthand column; it is "-" if the difference favors the other treatment group compared.

[b] The F statistic is omitted when the assumptions of the test are violated; for transformed scores, it is also omitted when the transformation is not needed.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

307

TABLE II-A-3-28a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score--Grade 3 Hispanic Students, Fall 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores			Transformed Scores		
		Proportion of Variance	F^b	(df)	Proportion of Variance	F^b	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.009	0.73	3,106	.059		
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.000	0.02	1,109	.002		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.006	0.67	3,156	.003		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.000	0.00	1,159	.000		
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.007	0.83	3,160	.059		
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.001	0.18	1,163	.001		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Non-Title VII, but same slopes for Title VII With Comparison and Title VII Without Comparison	.007	0.82	3,159	.060		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII Without Comparison and Non-Title VII (ANCOVA)	.000	0.11	1,162	.000		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Non-Title VII (ANCOVA)	.000	0.17	1,162	.001		

[a] The direction is "+" if the difference favors the treatment group named first in the lefthand column; it is "-" if the difference favors the other treatment group compared.

[b] The F statistic is omitted when the assumptions of the test are violated; for transformed scores, it is also omitted when the transformation is not needed.

* p < .10
** p < .05
*** p < .01
**** p < .001

TABLE II-A-3-29a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score (Rescored)--Grade 3 Hispanic Students, Fall 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores			Transformed Scores		
		Proportion of Variance	F^b	(df)	Proportion of Variance	F^b	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.009	0.73	3,106	.059		
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.000	0.02	1,109	.002		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.004	0.58	3,166	.002		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.002	0.72	1,169	.001		
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.003	0.47	3,170	.054		
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.000	0.08	1,173	.001		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Non-Title VII, but same slopes for Title VII With Comparison and Title VII Without Comparison	.004	0.52	3,169	.055		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII Without Comparison and Non-Title VII (ANCOVA)	.001	0.48	1,172	.000		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Non-Title VII (ANCOVA)	.000	0.00	1,172	.001		

[a] The direction is "+" if the difference favors the treatment group named first in the lefthand column; it is "-" if the difference favors the other treatment group compared.

[b] The F statistic is omitted when the assumptions of the test are violated; for transformed scores, it is also omitted when the transformation is not needed.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-A-3-30a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Vocabulary Expanded Standard Score--Grade 3 Hispanic Students, Fall 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores			Transformed Scores		
		Proportion of Variance	F^b	(df)	Proportion of Variance	F^b	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.021	1.32	3,105	.066		
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.000	0.00	1,109	.003		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.018	2.03	3,166	.007		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.000	0.09	1,169	.001		
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.006	0.66	3,170	.047		
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.000	0.16	1,173	.002		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Non-Title VII, but same slopes for Title VII With Comparison and Title VII Without Comparison	.006	0.63	3,169	.047		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII Without Comparison and Non-Title VII (ANCOVA)	.001	0.37	1,172	.001		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Non-Title VII (ANCOVA)	.000	0.05	1,172	.002		

[a] The direction is "+" if the difference favors the treatment group named first in the lefthand column; it is "-" if the difference favors the other treatment group compared.

[b] The F statistic is omitted when the assumptions of the test are violated; for transformed scores, it is also omitted when the transformation is not needed.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-A-3-31a

Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Computation Expanded Standard Score-- Grade 3 Hispanic Students, Fall 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores			Transformed Scores		
		Proportion of Variance	F^b	(df)	Proportion of Variance	F^b	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.012	0.56	3,103	.022		
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.009	1.27	1,106	.000		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.018	1.56	3,194	.004		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.001	0.25	1,197	.004		
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.003	0.26	3,198	.022		
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.004	0.98	1,201	.001		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Non-Title VII, but same slopes for Title VII With Comparison and Title VII Without Comparison	.003	0.23	3,197	.023		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII Without Comparison and Non-Title VII (ANCOVA)	.005	1.34	1,200	.003		
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Non-Title VII (ANCOVA)	.002	0.46	1,200	.000		

[a] The direction is "+" if the difference favors the treatment group named first in the lefthand column; it is "-" if the difference favors the other treatment group compared.

[b] The F statistic is omitted when the assumptions of the test are violated; for transformed scores, it is also omitted when the transformation is not needed.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-A-3-32a

Significance Tests for Covariate Differences (Means) Among Groups-- Grade 2 Hispanic Students, Fall 1976 Test Score Analysis

Outcome Variable	Title VII (Pooled) vs. Non-Title VII			Title VII (With Comparison) vs. Non-Title VII			Title VII (With Comparison) vs. Title VII (Without Comparison)		
	t	df	p	t	df	p	t	df	p
CTBS Reading Total Expanded Standard Score									
Fall 1975 Test Score (Pretest)	-3.308	159	***	-3.289	91	***	-1.410	105	
Socioeconomic Status	0.969	159		0.416	91		-0.561	105	
Number of School Days, Fall 1975 to Fall 1976	6.330	159	***	3.991	91	***	-2.558	105	**
CTBS Reading Total Expanded Standard Score (Rescored)									
Fall 1976 Test Score (Pretest)	-3.272	170	***	-3.161	97	***	-1.136	114	
Socioeconomic Status	1.240	170		0.646	97		-0.391	114	
Number of School Days, Fall 1975 to Fall 1976	6.100	170	***	3.972	97	***	-2.489	114	**
CTBS Reading Vocabulary Expanded Standard Score									
Fall 1975 Test Score (Pretest)	-3.485	171	***	-3.331	98	***	-0.957	115	
Socioeconomic Status	0.993	171		0.650	98		-0.394	115	
Number of School Days, Fall 1975 to Fall 1976	6.060	171	***	3.926	98	***	-2.599	115	**
CTBS Mathematics Computation Expanded Standard Score									
Fall 1975 Test Score (Pretest)	-4.696	184	***	-4.542	91	***	-0.298	131	
Socioeconomic Status	1.662	184		0.815	91		-0.787	131	
Number of School Days, Fall 1975 to Fall 1976	6.316	184	***	3.789	91	***	-2.528	131	**
Prueba de Lectura Total Raw Score		NA[a]			NA[a]				
Fall 1975 Test Score (Pretest)							-1.797	72	
Socioeconomic Status							-1.406	72	
Number of School Days, Fall 1975 to Fall 1976							-2.073	72	*
Prueba de Comprension Auditiva Ingles (ESL) Total Scaled Score		NA[a]			NA[a]				
Fall 1975 Test Score (Pretest)							-2.474	43	**
Socioeconomic Status							-2.015	43	
Number of School Days, Fall 1975 to Fall 1976							1.182	43	

[a] Insufficient numbers of non-Title VII students did not permit mean comparisons with that group on this variable.

*p ≤ .05

**p ≤ .01

***p ≤ .002

TABLE II-A-3-33a

Significance Tests for Covariate Differences (Means) Among Groups--Grade 3 Hispanic Students, Fall 1976 Test Score Analysis

Outcome Variable	Title VII (Pooled) vs. Non-Title VII			Title VII (With Comparison) vs. Non-Title VII			Title VII (With Comparison) vs. Title VII (Without Comparison)		
	t	df	p	t	df	p	t	df	p
CTBS Reading Total Expanded Standard Score									
Fall 1975 Test Score (Pretest)	0.050	166		1.751	112		3.207	111	**
Socioeconomic Status	1.785	166		1.731	112		0.982	111	
Number of School Days, Fall 1975 to Fall 1976	7.731	166	***	3.673	112	***	-8.447	111	***
CTBS Reading Total Expanded Standard Score (Rescored)									
Fall 1975 Test Score (Pretest)	-0.785	176		1.751	112		4.313	121	***
Socioeconomic Status	1.453	176		1.731	112		1.421	121	
Number of School Days, Fall 1975 to Fall 1976	6.585	176	***	3.673	112	***	-5.365	121	***
CTBS Reading Vocabulary Expanded Standard Score									
Fall 1975 Test Score (Pretest)	-1.023	176		0.989	112		3.499	121	***
Socioeconomic Status	1.453	176		1.731	112		1.421	121	
Number of School Days, Fall 1975 to Fall 1976	6.585	176	***	3.673	112	***	-5.365	121	***
CTBS Mathematics Computation Expanded Standard Score									
Fall 1975 Test Score (Pretest)	-1.666	204		1.252	109		5.165	149	***
Socioeconomic Status	2.261	204	*	1.708	109		0.000	149	
Number of School Days, Fall 1975 to Fall 1976	7.154	204	***	3.427	109	***	-5.085	149	***
Prueba de Lectura Total Raw Score		NA[a]			NA[a]				
Fall 1975 Test Score (Pretest)							0.673	68	
Socioeconomic Status							1.035	68	
Number of School Days, Fall 1975 to Fall 1976							-5.600	68	***
Prueba de Comprension Auditiva Ingles (ESL) Total Scaled Score		NA[a]			NA[a]				
Fall 1975 Test Score (Pretest)							0.346	52	
Socioeconomic Status							-0.161	52	
Number of School Days, Fall 1975 to Fall 1976							-2.827	52	**

[a] Insufficient numbers of non-Title VII students did not permit mean comparisons with that group on this variable.

*p $\leq$ .05

**p $\leq$ .01

***p $\leq$ .002

TABLE II-A-3-34a

Correlations and Partial Correlations[a] Between Title VII (With Comparison)[b]/Non-Title VII Group Membership and Fall 1975, Spring 1976, and Fall 1976 Test Scores--Grade 2, Hispanic Students

Variable	Treatment/Test Score Correlations			t Test of Differences Between Fall 1975 and Fall 1976 Coefficients[c]
	Fall 1975	Spring 1976	Fall 1976	t
CTBS Reading Total Expanded Standard Score				
r	-.326[d] (91)	-.457 (91)	-.392 (91)	-0.795[e]
partial r	-.380 (89)	NA[f]	-.493 (89)	-1.391*
CTBS Reading Total Expanded Standard Score (Rescored)				
r	-.306 (97)	-.477 (97)	-.425 (97)	-1.346
partial r	-.343 (95)	NA	-.526 (95)	-2.140*

---

[a] The covariables partialed out of the treatment test correlations were socioeconomic status and approximate number of school days between fall 1975 and fall 1976 testing.

[b] Includes only those Title VII Hispanic students in classrooms for which there was an identified Non-Title VII comparison classroom.

[c] The formula used to test the difference between rs was

$$t = \frac{\left[(r_{12} - r_{13}) \sqrt{(N-5)(1 + r_{23})} \right]}{2\sqrt{2(1 - r_{12}^2 - r_{13}^2 - r_{23}^2 + 2r_{12}r_{13}r_{23})}} \quad \text{where,}$$

variable 1 is Title VII/Non-Title VII treatment variable 2 is fall 1976 test score, and variable 3 is fall 1975 test score. The "t" statistics based on partial correlations used partial correlations, but were otherwise the same.

[d] The sign of the correlation is "+" if the Title VII mean is higher than the Non-Title mean; it is "-" if the reverse is true.

[e] A positive "t" indicates greater gains in Title VII; a negative "t" indicates the reverse.

[f] Not applicable, since approximate number of school days between fall 1975 and fall 1976 testing was a covariable.

TABLE II-A-3-34a (continued)

Correlations and Partial Correlations Between Title VII (With Comparison)/Non-Title VII Group Membership and Fall 1975, Spring 1976, and Fall 1976 Test Scores--Grade 2, Hispanic Students

Variable	Treatment/Test Score Correlations			**t Test of Differences Between Fall 1975 and Fall 1976 Coefficients**
	Fall 1975	**Spring 1976**	**Fall 1976**	**t**
CTBS Reading Vocabulary Expanded Standard Score				
r	-.318 (98)	-.457 (98)	-.365 (98)	-.550
partial r	-.374 (96)	NA	-.455 96)	-.984
CTBS Mathematics Computation Expanded Standard Score				
r	-.431 (91)	-.291 (91)	-.451 (91)	-0.234
partial r	-.372 (89)	NA	-.500 (89)	-1.568
Prueba de Lectura (Spanish Reading) Total Raw Score				
r	Insufficient degrees of freedom	Insufficient degrees of freedom	Insufficient degrees of freedom	
partial r				
Prueba de Comprension Auditiva Ingles (ESL) Scaled Score				
r	Insufficient degrees of freedom	Insufficient degrees of freedom	Insufficient degrees of freedom	
partial r				

* $p < .05$

** $p < .01$

*** $p < .002$

TABLE II-A-3-35a

Correlations and Partial Correlations[a] Between Title VII (With Comparison)[b]/Non-Title VII Group Membership and Fall 1975, Spring 1976, and Fall 1976 Test Scores--Grade 3, Hispanic Students

Variable	Treatment/Test Score Correlations			t Test of Differences Between Fall 1975 and Fall 1976 Coefficients[c]
	Fall 1975	Spring 1976	Fall 1976	t
CTBS Reading Total Expanded Standard Score				
r	.163[d] (112)	.118 (112)	.147 (112)	-.230[e]
partial r	.118 (110)	NA[f]	.090 (110)	-.387
CTBS Reading Total Expanded Standard Score (Rescored)				
r	.163[g] (112)	.118 (112)	.147 (112)	-.230
partial r	.118 (110)	NA	.090 (110)	-.387

---

[a] The covariables partialed out of the treatment test correlations were socioeconomic status and approximate number of school days between fall 1975 and fall 1976 testing.

[b] Includes only those Title VII Hispanic students in classrooms for which there was an identified Non-Title VII comparison classroom.

[c] The formula used to test the difference between rs was

$$t = \frac{\left[(r_{12} - r_{13}) \sqrt{(N-5)(1 + r_{23})} \right]}{2\sqrt{2(1 - r_{12}^2 - r_{13}^2 - r_{23}^2 + 2r_{12}r_{13}r_{23})}} \quad \text{where,}$$

variable 1 is Title VII/Non-Title VII treatment, variable 2 is fall 1976 test score, and variable 3 is fall 1975 test score. The "t" statistics based on partial correlations used partial correlations, but were otherwise the same.

[d] The sign of the correlation is "+" if the Title VII mean is higher than the Non-Title mean; it is "-" if the reverse is true.

[e] A positive "t" indicates greater gains in Title VII; a negative "t" indicates the reverse.

[f] Not applicable, since approximate number of school days between fall 1975 and fall 1976 testing was a covariable.

[g] For some cohorts, rescoring had no effect.

TABLE II-A-3-35a (continued)

Correlations and Partial Correlations Between Title VII (With Comparison)/Non-Title VII Group Membership and Fall 1975, Spring 1976, and Fall 1976 Test Scores--Grade 3, Hispanic Students

Variable	**Treatment/Test Score Correlations**			**t Test of Differences Between Fall 1975 and Fall 1976 Coefficients**
	Fall 1975	**Spring 1976**	**Fall 1976**	**t**
CTBS Reading Vocabulary Expanded Standard Score				
r	.093 (112)	.082 (112)	.081 (112)	-.149
partial r	.043 (110)	NA	.027 (110)	-.196
CTBS Mathematics Computation Expanded Standard Score				
r	.118 (109)	.197 (109)	.139 (109)	+.212
partial r	.080 (107)	NA	.134 (107)	+.541
Prueba de Lectura (Spanish Reading) Total Raw Score				
r **partial r**	Insufficient degrees of freedom	Insufficient degrees of freedom	Insufficient degrees of freedom	
Prueba de Comprension Auditiva Ingles (ESL) Scaled Score				
r **partial r**	Insufficient degrees of freedom	Insufficient degrees of freedom	Insufficient degrees of freedom	

$^{*}p < .05$

$^{**}p < .01$

$^{***}p < .002$

TABLE II-A-3-36a

Correlations and Partial Correlations[a] Between Title VII (With Comparison)[b]/Title VII (Without Comparison)[c] Group Membership and Fall 1975, Spring 1976, and Fall 1976 Test Scores--Grade 2, Hispanic Students

Variable	Treatment/Test Score Correlations			t Test of Differences Between Fall 1975 and Fall 1976 Coefficients[d]
	Fall 1975	Spring 1976	Fall 1976	t
CTBS Reading Total Expanded Standard Score				
r	-.135[e] (105)	-.220 (105)	-.141 (105)	-.066[f]
partial r	-.169 (103)	NA[g]	-.154 (103)	+.160
CTBS Reading Total Expanded Standard Score (Rescored)				
r	-.106 (114)	-.177 (114)	-.129 (114)	-.251
partial r	-.122 (112)	NA	-.144 (112)	-.241

[a] The covariables partialed out of the treatment test correlations were socioeconomic status and approximate number of school days between fall 1975 and fall 1976 testing.

[b] Includes only those Title VII Hispanic students in classrooms for which there was an identified Non-Title VII comparison classroom.

[c] Includes only those Title VII Hispanic students in classrooms for which there was no identified Non-Title VII comparison classroom.

[d] The formula used to test the difference between rs was

$$t = \frac{\left[(r_{12} - r_{13}) \sqrt{(N-5)(1 + r_{23})} \right]}{2\sqrt{2(1 - r_{12}^2 - r_{13}^2 - r_{23}^2 + 2r_{12}r_{13}r_{23})}} \quad \text{where,}$$

variable 1 is Title VII (with comparison)/Title VII (without comparison) treatment, variable 2 is fall 1976 test score, and variable 3 is fall 1975 test score. The "t" statistics based on partial correlations used partial correlations, but were otherwise the same.

[e] The sign of the correlation is "+" if the Title VII (with comparison) mean is higher than the Title VII (without comparison) mean; it is "-" if the reverse is true.

[f] A positive "t" indicates greater gains in schools with comparisons; a negative "t" indicates the reverse.

[g] Not applicable, since approximate number of school days between fall 1975 and fall 1976 testing was a covariable.

TABLE II-A-3-36a (Continued)

Correlations and Partial Correlations Between Title VII (With Comparison)/Title VII (Without Comparison) Group Membership and Fall 1975, Spring 1976, and Fall 1976 Test Scores--Grade 2, Hispanic Students

Variable	**Treatment/Test Score Correlations**			**t Test of Differences Between Fall 1975 and Fall 1976 Coefficients**
	Fall 1975	**Spring 1976**	**Fall 1976**	**t**
CTBS Reading Vocabulary Expanded Standard Score				
r	-.088 (115)	-.197 (115)	-.067 (115)	+.237
partial r	-.093 (113)	NA	-.100 (113)	-.073
CTBS Mathematics Computation Expanded Standard Score				
r	-.027 (131)	-.163 (131)	-.193 (131)	-2.302*
partial r	-.048 (129)	NA	-.196 (129)	-2.088*
Prueba de Lectura (Spanish Reading) Total Raw Score				
r	-.206 (72)	-.414 (72)	-.361 (72)	-1.893
partial r	-.010 (70)	NA	-.115 (70)	-1.255
Prueba de Comprension Auditiva Ingles (ESL) Scaled Score				
r	-.352 (43)	-.400 (43)	.004 (43)	+3.156**
partial r	-.283 (41)	NA	+.110 (41)	+3.401***

*p < .05

**p < .01

***p < .002

TABLE II-A-3-37a

Correlations and Partial Correlations[a] Between
Title VII (With Comparison)[b]/Title VII (Without Comparison)[c]
Group Membership and Fall 1975, Spring 1976, and
Fall 1976 Test Scores--Grade 3, Hispanic Students

Variable	Treatment/Test Score Correlations			t Test of Differences Between Fall 1975 and Fall 1976 Coefficients[d]
	Fall 1975	Spring 1976	Fall 1976	t
CTBS Reading Total Expanded Standard Score				
r	.291[e] (111)	.244 (111)	.233 (111)	-.941[f]
partial r	.231 (109)	NA[g]	.167 (109)	-.993
CTBS Reading Total Expanded Standard Score (Rescored)				
r	.365 (121)	.290 (121)	.305 (121)	-1.094
partial r	.399 (119)	NA	.350 (119)	- .895

[a] The covariables partialed out of the treatment test correlations were socioeconomic status and approximate number of school days between fall 1975 and fall 1976 testing.

[b] Includes only those Title VII Hispanic students in classrooms for which there was an identified Non-Title VII comparison classroom.

[c] Includes only those Title VII Hispanic students in classrooms for which there was no identified Non-Title VII comparison classroom.

[d] The formula used to test the difference between rs was

$$t = \frac{\left[(r_{12} - r_{13}) \sqrt{(N-5)(1 + r_{23})} \right]}{2\sqrt{2(1 - r_{12}^2 - r_{13}^2 - r_{23}^2 + 2r_{12}r_{13}r_{23})}} \quad \text{where,}$$

variable 1 is Title VII (with comparison)/Title VII (without comparison) treatment, variable 2 is fall 1976 test score, and variable 3 is fall 1975 test score. The "t" statistics based on partial correlations used partial correlations, but were otherwise the same.

[e] The sign of the correlation is "+" if the Title VII (with comparison) mean is higher than the Title VII (without comparison) mean; it is "-" if the reverse is true.

[f] A positive "t" indicates greater gains in schools with comparisons; a negative "t" indicates the reverse.

[g] Not applicable, since approximate number of school days between fall 1975 and fall 1976 testing was a covariable.

TABLE II-A-3-37a (Continued)

Correlations and Partial Correlations Between Title VII (With Comparison)/Title VII (Without Comparison) Group Membership and Fall 1975, Spring 1976, and Fall 1976 Test Scores--Grade 3, Hispanic Students

Variable	**Treatment/Test Score Correlations**			**t Test of Differences Between Fall 1975 and Fall 1976 Coefficients**
	Fall 1975	**Spring 1976**	**Fall 1976**	**t**
CTBS Reading Vocabulary Expanded Standard Score				
r	.303 (121)	.253 (121)	.221 (121)	-1.326
partial r	.303 (119)		.229 (119)	-1.184
CTBS Mathematics Computation Expanded Standard Score				
r	.390 (149)	.236 (149)	.127 (149)	-3.319***
partial r	.406 (147)		.154 (147)	-3.274***
Prueba de Lectura (Spanish Reading) Total Raw Score				
r	.082 (68)	-.070 (68)	.078 (68)	-.038
partial r	.260 (66)		.174 (66)	-.992
Prueba de Comprension Auditiva Ingles (ESL) Scaled Score				
r	.046 (52)	-.071 (52)	.101 (52)	+.421
partial r	-.084 (50)		-.010 (50)	+.579

*$p < .05$

**$p < .01$

***$p < .002$

TABLE II-A-3-38a

Correlations and Partial Correlations[a] Between Title VII (Pooled)[b]/Non-Title VII Group Membership and Fall 1975, Spring 1976, and Fall 1976 Test Scores--Grade 2, Hispanic Students

Variable	Treatment/Test Score Correlations			t Test of Differences Between Fall 1975 and Fall 1976 Coefficients[c]
	Fall 1975	Spring 1976	Fall 1976	t
CTBS Reading Total Expanded Standard Score				
r	-.253[d] (159)	-.275 (159)	-.297 (159)	-.674[e]
partial r	-.228 (157)	NA[f]	-.293 (157)	-.997
CTBS Reading Total Expanded Standard Score (Rescored)				
r	-.243 (170)	-.298 (170)	-.329 (170)	-1.285
partial r	-.224 (168)	NA	-.329 (168)	-1.570

---

[a] The covariables partialed out of the treatment test correlations were socioeconomic status and approximate number of school days between fall 1975 and fall 1976 testing.

[b] Includes both Title VII Hispanic students in classrooms for which there was an identified Non-Title VII comparison classroom and students in classrooms for which there was no identified Non-Title VII comparison classroom.

[c] The formula used to test the difference between rs was

$$t = \frac{\left[(r_{12} - r_{13}) \sqrt{(N-5)(1+r_{23})} \right]}{2\sqrt{2(1 - r_{12}^2 - r_{13}^2 - r_{23}^2 + 2r_{12}r_{13}r_{23})}} \quad \text{where,}$$

variable 1 is Title VII/Non-Title VII treatment, variable 2 is fall 1976 test score, and variable 3 is fall 1975 test score. The "t" statistics based on partial correlations used partial correlations, but were otherwise the same.

[d] The sign of the correlation is "+" if the Title VII mean is higher than the Non-Title mean; it is "-" if the reverse is true.

[e] A positive "t" indicates greater gains in Title VII; a negative "t" indicates the reverse.

[f] Not applicable, since approximate number of school days between fall 1975 and fall 1976 testing was a covariable.

TABLE II-A-3-38a (Continued)

Correlations and Partial Correlations Between
Title VII (Pooled)/Non-Title VII
Group Membership and Fall 1975, Spring 1976, and Fall 1976
Test Scores--Grade 2, Hispanic Students

Variable	Treatment/Test Score Correlations			t Test of Differences Between Fall 1975 and Fall 1976 Coefficients
	Fall 1975	Spring 1976	Fall 1976	t
CTBS Reading Vocabulary Expanded Standard Score				
r	-.257 (171)	-.284 (171)	-.292 (171)	-.530
partial r	-.250 (169)	NA	-.275 (169)	-.397
CTBS Mathematics Computation Expanded Standard Score				
r	-.328 (184)	-.116 (184)	-.295 (184)	+.542
partial r	-.266 (182)	NA	-.328 (182)	-1.070
Prueba de Lectura (Spanish Reading) Total Raw Score				
r partial r	Insufficient degrees of freedom	Insufficient degrees of freedom	Insufficient degrees of freedom	
Prueba de Comprension Auditiva Ingles (ESL) Scaled Score				
r partial r	Insufficient degrees of freedom	Insufficient degrees of freedom	Insufficient degrees of freedom	

*p < .05

**p < .01

***p < .002

TABLE II-A-3-39a

Correlations and Partial Correlations[a] Between Title VII (Pooled)[b]/Non-Title VII Group Membership and Fall 1975, Spring 1976, and Fall 1976 Test Scores--Grade 3, Hispanic Students

Variable	Treatment/Test Score Correlations			t Test of Differences Between Fall 1975 and Fall 1976 Coefficients[c]
	Fall 1975	Spring 1976	Fall 1976	t
CTBS Reading Total Expanded Standard Score				
r	.003[d] (166)	-.000 (166)	.040 (166)	+.657[e]
partial r	.055 (164)	NA[f]	.063 (164)	+.133
CTBS Reading Total Expanded Standard Score (Rescored)				
r	-.059 (176)	-.039 (176)	-.025 (176)	+.663
partial r	-.089 (174)	NA	-.080 (174)	+.167

[a] The covariables partialed out of the treatment test correlations were socioeconomic status and approximate number of school days between fall 1975 and fall 1976 testing.

[b] Includes both Title VII Hispanic students in classrooms for which there was an identified Non-Title VII comparison classroom and students in classrooms for which there was no identified Non-Title VII comparison classroom.

[c] The formula used to test the difference between rs was

$$t = \frac{\left[(r_{12} - r_{13}) \sqrt{(N-5)(1 + r_{23})} \right]}{2\sqrt{2(1 - r_{12}^2 - r_{13}^2 - r_{23}^2 + 2r_{12}r_{13}r_{23})}} \quad \text{where,}$$

variable 1 is Title VII/Non-Title VII treatment, variable 2 is fall 1976 test score, and variable 3 is fall 1975 test score. The "t" statistics based on partial correlations used partial correlations, but were otherwise the same.

[d] The sign of the correlation is "+" if the Title VII mean is higher than the Non-Title mean; it is "-" if the reverse is true.

[e] A positive "t" indicates greater gains in Title VII; a negative "t" indicates the reverse.

[f] Not applicable, since approximate number of school days between fall 1975 and fall 1976 testing was a covariable.

TABLE II-A-3-39a (Continued)

Correlations and Partial Correlations Between
Title VII (Pooled)/Non-Title VII
Group Membership and Fall 1975, Spring 1976, and Fall 1976
Test Scores--Grade 3, Hispanic Students

Variable	**Treatment/Test Score Correlations**			**t Test of Differences Between Fall 1975 and Fall 1976 Coefficients**
	Fall 1975	**Spring 1976**	**Fall 1976**	**t**
CTBS Reading Vocabulary Expanded Standard Score				
r	-.077 (176)	-.048 (176)	-.038 (176)	+.666
partial r	-.081 (174)	NA	-.071 (174)	+.177
CTBS Mathematics Computation Expanded Standard Score				
r	-.117 (204)	.042 (204)	.051 (204)	+2.352*
partial r	-.100 (202)	NA	-.011 (202)	+1.594
Prueba de Lectura (Spanish Reading) Total Raw Score				
r **partial r**	Insufficient degrees of freedom	Insufficient degrees of freedom	Insufficient degrees of freedom	
Prueba de Comprension Auditiva Ingles (ESL) Scaled Score				
r **partial r**	Insufficient degrees of freedom	Insufficient degrees of freedom	Insufficient degrees of freedom	

$*p < .05$

$**p < .01$

$***p < .002$

APPENDIX II-B

SUPPORTING TABLES FOR CHAPTER II, SECTION B

TABLE II-B-1a

Calibration Sample and Validation Sample Means and Standard Deviation for Factor Score 1 and Factor Score 2 by Teacher Assessment of Student Language Dominance--Grade 2 Students

Teacher Assessment of Student Language Dominance	Factor Score 1		Factor Score 2	
	Calibration Sample	Validation Sample	Calibration Sample	Validation Sample
Monolingual Spanish Speaker				
Mean	-1.81	-1.88	-0.21	-0.41
Standard Deviation	1.03	1.19	1.19	1.28
N	167	167	152	151
Bilingual English/Spanish Speaker				
Mean	-0.50	-0.38	-0.03	0.03
Standard Deviation	1.15	1.17	1.35	1.34
N	485	514	454	472
Monolingual English Speaker				
Mean	1.69	1.65	-0.72	-0.78
Standard Deviation	1.06	1.00	1.34	1.48
N	240	218	222	196
F	545.75	478.19	20.59	25.62
η^2	0.55	0.52	0.05	0.06

TABLE II-B-2a

Calibration Sample and Validation Sample Means and Standard Deviation for Factor Score 1 and Factor Score 2 by Teacher Assessment of Student Language Dominance--Grade 3 Students

Teacher Assessment of Student Language Dominance	Factor Score 1		Factor Score 2	
	Calibration Sample	Validation Sample	Calibration Sample	Validation Sample
Monolingual Spanish Speaker				
Mean	-1.68	-1.80	-0.06	-0.17
Standard Deviation	1.14	1.14	1.08	1.13
N	182	180	168	167
Bilingual English/Spanish Speaker				
Mean	-0.33	-0.30	0.12	0.13
Standard Deviation	1.11	1.01	1.17	1.16
N	695	698	655	669
Monolingual English Speaker				
Mean	1.75	1.78	-0.76	-0.57
Standard Deviation	1.02	0.97	1.25	1.18
N	325	309	299	282
F	660.86	779.88	57.54	36.89
η^2	0.52	0.57	0.09	0.06

TABLE II-B-3a

Calibration Sample and Validation Sample Means and Standard Deviation for Factor Score 1 and Factor Score 2 by Teacher Assessment of Student Language Dominance--Grade 4 Students

Teacher Assessment of Student Language Dominance	Factor Score 1		Factor Score 2	
	Calibration Sample	Validation Sample	Calibration Sample	Validation Sample
Monolingual Spanish Speaker				
Mean	-2.12	-1.94	-0.25	-0.28
Standard Deviation	1.24	1.32	1.41	1.44
N	103	88	97	81
Bilingual English/Spanish Speaker				
Mean	-0.26	-0.28	0.33	0.39
Standard Deviation	1.06	1.02	1.20	0.97
N	799	756	763	730
Monolingual English Speaker				
Mean	1.84	1.89	-0.51	-0.54
Standard Deviation	1.08	0.92	1.10	1.20
N	255	287	236	279
F	584.23	661.64	48.46	80.58
η^2	0.50	0.54	0.08	0.13

TABLE II-B-4a

Calibration Sample and Validation Sample Means and Standard Deviation for Factor Score 1 and Factor Score 2 by Teacher Assessment of Student Language Dominance--Grade 5 Students

Teacher Assessment of Student Language Dominance	Factor Score 1		Factor Score 2	
	Calibration Sample	Validation Sample	Calibration Sample	Validation Sample
Monolingual Spanish Speaker				
Mean	-2.16	-2.20	0.17	-0.07
Standard Deviation	1.15	1.22	0.95	1.21
N	63	82	57	72
Bilingual English/Spanish Speaker				
Mean	-0.23	-0.19	0.52	0.45
Standard Deviation	1.05	0.99	0.91	0.84
N	489	486	456	448
Monolingual English Speaker				
Mean	1.72	1.85	-0.33	-0.50
Standard Deviation	0.86	0.86	1.26	1.15
N	193	187	176	170
F	430.69	539.01	45.83	61.70
η^2	0.54	0.59	0.12	0.15

TABLE II-B-5a

Calibration Sample and Validation Sample Means and Standard Deviation for Factor Score 1 and Factor Score 2 by Teacher Assessment of Student Language Dominance--Grade 6 Students

Teacher Assessment of Student Language Dominance	Factor Score 1		Factor Score 2	
	Calibration Sample	Validation Sample	Calibration Sample	Validation Sample
Monolingual Spanish Speaker				
Mean	-2.55	-2.36	-0.36	-0.05
Standard Deviation	1.23	1.25	1.36	0.88
N	49	50	44	44
Bilingual English/Spanish Speaker				
Mean	-0.19	-0.26	0.47	0.43
Standard Deviation	0.94	0.99	0.81	0.74
N	259	267	227	242
Monolingual English Speaker				
Mean	1.94	2.07	-0.59	-0.49
Standard Deviation	0.85	0.80	1.23	0.98
N	97	101	90	98
F	375.12	378.69	40.78	44.09
n^2	0.65	0.65	0.19	0.19

TABLE II-B-6a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.003	.065	6, 493
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.017	20.30*** (-15.4)	1, 499
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.007	1.46	6, 626
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	.001	1.01	1, 632
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.006	2.08*	6, 857
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.004	8.57	1, 863
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.003	1.00	6, 864
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.003	6.62** (-7.1)	1, 870

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-7a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.002	0.71	6, 1065
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.006	15.46**** (-8.9)	1, 1071
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.008	2.44***	6, 750
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	.016	28.40**** (-15.1)	1, 756
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.007	3.97****	6, 1353
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.002	6.14**	1, 1359
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.001	0.59	6, 1360
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.008	25.38**** (-10.7)	1, 1366

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-8a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.008	4.65****	6, 960
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.012	39.64**** (+13.3)	1, 966
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.001	0.83	6, 983
Title VII Without Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.003	12.16**** (+7.0)	1, 989
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.005	5.04****	6, 1435
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.001	4.98**	1, 1441
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.002	2.10*	6, 1442
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.006	33.68**** (+10.5)	1, 1448

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* p < .10
** p < .05
*** p < .01
**** p < .001

TABLE II-B-9a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.027	3.08***	6, 257
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.002	1.022	1, 263
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.005	1.19	6, 734
Title VII Without Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.001	1.84	1, 740
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.014	4.19****	6, 854
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.002	3.38*	1, 860
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.004	1.14	6, 861
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.001	1.60	1, 867

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-10a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score--Grade 6 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.031	1.29	6, 97
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.001	0.13	1, 103
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.021	3.59***	6, 352
Title VII Without Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.006	6.28** (-17.5)	1, 358
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.004	0.69	6, 388
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.000	0.19	1, 394
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.018	3.55***	6, 395
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.005	5.97** (-16.9)	1, 401

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-11a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score (Rescored)--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.012	2.56*	13, 585
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.012	14.95**** (-12.9)	1, 591
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.011	2.73**	6, 703
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	0.002	3.59* (-5.8)	1, 709
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.020	7.06****	6, 998
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.000	0.103	1, 1004
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.006	1.95*	6, 1005
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.004	7.50*** (-7.7)	1, 1011

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-12a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score (Rescored)--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.002	0.80	6, 1077
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.006	15.87**** (-9.0)	1, 1083
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.007	2.40**	6, 778
Title VII Without Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.014	26.67**** (-14.6)	1, 784
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.007	4.36****	6, 1387
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.001	4.05**	1, 1393
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.001	0.61	6, 1394
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.007	24.97**** (-10.6)	1, 1400

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-13a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score (Rescored)--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.009	4.91^{****}	6, 966
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.012	41.82^{****} (+13.7)	1, 972
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.002	1.33	6, 991
Title VII Without Comparison, Non-Title VII	Separate regres-gression intercepts (ANCOVA)	0.004	14.85^{****} (+7.9)	1, 997
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.005	4.31^{****}	6, 1445
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.001	3.63^{*}	1, 1451
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.003	2.63^{**}	6, 1452
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.007	36.49^{****} (+11.0)	1, 1458

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-14a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score (Rescored)--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.027	3.14***	6, 259
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.001	0.94	1, 265
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.005	1.17	6, 741
Title VII Without Comparison, Non-Title VII	Separate regregression intercepts (ANCOVA)	.001	1.96	1, 747
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.013	4.15****	6, 863
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.002	4.03***	1, 869
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.004	1.13	6, 870
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.001	1.67	1, 876

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-15a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Total Expanded Standard Score (Rescored)--Grade 6 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.032	1.36	6, 98
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.000	0.01	1, 104
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.021	3.59***	6, 352
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	.006	6.28** (-17.5)	1, 358
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.004	0.80	6, 389
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.000	0.51	1, 395
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.019	3.58***	6, 396
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.005	5.50** (-16.3)	1, 402

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-16a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Vocabulary Expanded Standard Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.010	2.07*	6, 582
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.012	14.61**** (-12.9)	1, 588
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.008	1.82*	6, 701
Title VII Without Comparison, Non-Title VII	Separate regres-gression intercepts (ANCOVA)	0.002	3.10* (-5.4)	1, 707
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.117	4.00****	6, 994
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.001	2.33	1, 1000
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.004	1.27	6, 1001
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.004	8.41*** (-8.0)	1, 1007

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-17a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Vocabulary Expanded Standard Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.004	1.33	6, 1097
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.003	6.47** (-5.9)	1, 1103
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.003	0.88	6, 799
Title VII Without Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.007	11.73*** (-10.0)	1, 805
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.005	2.42**	6, 1415
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.001	3.14*	1, 1421
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.001	0.67	6, 1422
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.004	11.37*** (-7.4)	1,1428

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-18a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Vocabulary Expanded Standard Score--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.009	3.94****	6, 977
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.015	39.37**** (+13.8)	1, 983
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.003	1.59	6, 996
Title VII Without Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.006	19.74**** (+9.5)	1, 1002
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.004	3.14***	6, 1457
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.000	1.86	1, 1463
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.003	2.59**	6, 1464
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.009	40.32**** (+11.9)	1, 1470

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-19a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Vocabulary Expanded Standard Score--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.017	2.45**	6, 265
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.003	2.19	1, 271
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.008	2.52**	6, 744
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	.001	1.80	1, 750
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.003	1.18	6, 872
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.010	24.63****	1, 878
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.006	2.28**	6, 879
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.000	0.39	1, 885

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-20a

Regression Analysis and Analysis of Covariance Results for CTBS Reading Vocabulary Expanded Standard Score--Grade 6 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.030	1.36	6, 99
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.016	4.15** (+25.4)	1, 105
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.006	1.09	6, 371
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	.000	0.35	1, 377
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.007	1.30	6, 408
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.002	2.76*	1, 414
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.006	1.10	6, 415
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.000	0.56	1, 421

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-21a

Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Computation Expanded Standard Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.006	0.86	6, 575
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.008	7.43*** (+7.5)	1, 581
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.002	0.41	6, 707
Title VII Without Comparison, Non-Title VII	Separate regres-gression intercepts (ANCOVA)	.002	1.85	1, 713
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.004	0.99	6, 998
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.004	5.41**	1, 1004
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.002	0.57	6, 1005
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.003	4.55** (+4.7)	1, 1011

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-22a

Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Computation Expanded Standard Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.013	4.05****	6, 1055
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.001	1.62	1, 1061
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.039	8.65****	6, 783
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	.000	0.000	1, 789
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.011	4.30****	6, 1383
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.001	2.84*	1, 1389
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.017	6.55****	6, 1396
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.000	0.32	1, 1396

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-23a

Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Computation Expanded Standard Score--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.006	2.37**	6, 919
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.000	0.60	1, 925
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.025	8.92****	6, 931
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	0.003	7.00*** (+5.7)	1, 937
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.008	4.17****	6, 1393
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.001	1.96	1, 1399
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.012	6.47****	6, 1400
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.001	4.59** (+3.8)	1, 1406

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-24a

Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Computation Expanded Standard Score--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.008	0.91	6, 261
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.034	21.51**** (+28.3)	1, 267
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.009	2.23**	6, 720
Title VII Without Comparison, Non-Title VII	Separate regregression intercepts (ANCOVA)	.001	0.92	1, 726
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.006	1.69	6, 847
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.010	17.29****	1, 853
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.007	2.07*	6, 854
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.002	3.70* (+7.6)	1, 860

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-25a

Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Computation Expanded Standard Score--Grade 6 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.025	1.25	6, 101
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.002	0.56	1, 107
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.014	1.73	6, 356
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	.002	1.45	1, 362
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.016	2.17**	6, 393
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.000	0.12	1, 399
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.013	1.72	6, 400
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.002	1,89	1, 406

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-26a

Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Total Expanded Standard Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.008	1.41	6, 563
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.000	0.32	1, 569
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.002	0.40	6, 691
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	.000	0.33	1, 697
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.004	1.31	6, 981
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.000	0.41	1, 987
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.002	0.70	6, 988
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.000	0.45	1, 994

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-27a

Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Total Expanded Standard Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.012	5.24****	6, 986
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.001	2.30	1, 992
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.021	5.70****	6, 678
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	.002	3.10* (+4.3)	1, 684
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.007	3.59***	6, 1245
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.0	0.00	1,1251
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.012	6.05****	6, 1252
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.001	2.12	1, 1258

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-28a

Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Total Expanded Standard Score--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.003	1.66	6, 875
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.001	1.98	1, 881
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.009	4.28****	6, 859
Title VII Without Comparison, Non-Title VII	Separate regres-gression intercepts (ANCOVA)	0.006	17.39**** (+7.7)	1, 865
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.003	2.61**	6, 1301
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.001	6.70***	1, 1307
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.004	2.80**	6, 1308
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.002	10.61*** (+5.0)	1, 1314

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-29a

Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Total Expanded Standard Score--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.012	1.40	6, 236
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.023	15.93**** (+21.8)	1, 242
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.011	2.94***	6,648
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	0.001	2.07	1, 654
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.003	1.12	6, 754
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.006	10.87***	1, 760
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.009	2.92***	6, 761
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.003	5.02** (+8.0)	1, 767

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-30a

Regression Analysis and Analysis of Covariance Results for CTBS Mathematics Total Expanded Standard Score--Grade 6 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.017	0.97	6, 93
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.001	0.25	1, 99
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.013	1.83*	6, 326
Title VII Without Comparison, Non-Title VII	Separate regres-gression intercepts (ANCOVA)	.002	1.98	1, 332
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.011	1.84	6, 361
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.000	0.06	1, 367
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.011	1.79*	6, 368
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.003	2.54	1, 374

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-31a

Regression Analysis and Analysis of Covariance Results for English as a Second Language Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.015	0.72	6, 133
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.002	0.55	1, 139
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.029	1.20	6, 114
Title VII Without Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.000	0.072	1, 120
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.030	2.41	6, 238
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.003	1.52	1, 244
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.009	0.72	6, 245
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.000	0.138	1, 251

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

357

TABLE II-B-32a

Regression Analysis and Analysis of Covariance Results for English as a Second Language Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.077	2.63**	6, 67
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.090	16.26**** (+7.6)	1, 73
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.053	1.61	6, 95
Title VII Without Comparison, Non-Title VII	Separate regres-gression intercepts (ANCOVA)	.035	6.30** (+6.3)	1, 101
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.007	0.36	6, 160
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.001	0.24	1, 166
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.037	2.05*	6, 167
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.031	9.83*** (+6.6)	1, 173

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-33a

Regression Analysis and Analysis of Covariance Results for English As A Second Language Score--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.234	8.31****	6, 50
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.058	6.92** (+5.6)	1, 56
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.119	1.93	6, 39
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	0.03	2.87* (+4.4)	1, 45
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.026	0.91	6, 83
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.002	0.52	1, 89
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0, 119	4.22***	6, 90
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.034	5.98** (+4.9)	1, 96

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-34a

Regression Analysis and Analysis of Covariance Results for English as a Second Language Score--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.020	0.41	6, 2
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.016	3.52* (+4.4)	1, 8
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.009	0.35	6, 88
Title VII Without Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.000	0.09	1, 94
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.013	0.49	6, 87
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.001	0.28	1, 93
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.008	0.33	6, 94
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.001	0.13	1, 100

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-35a

Regression Analysis and Analysis of Covariance Results for Prueba de Lectura Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.201	1.39	6, 202
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.000	0.05	1, 208
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.026	1.47	6, 153
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	.011	3.57* (+4.9)	1, 159
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.049	5.94****	6, 349
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.035	23.28****	1, 355
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.011	1.16	6, 356
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.001	0.64	1, 362

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-36a

Regression Analysis and Analysis of Covariance Results for Prueba de Lectura Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.004	0.76	6, 326
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.001	0.86	1, 322
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.008	0.40	6, 141
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	.007	2.07	1, 147
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.013	2.95***	6, 465
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.001	1.35	1, 471
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.003	0.59	6, 472
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.001	1.08	1, 478

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-37a

Regression Analysis and Analysis of Covariance Results for Prueba de Lectura Score--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.008	1.40	6, 252
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.002	1.90	1, 258
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.018	1.86*	6, 182
Title VII Without Comparison, Non-Title VII	Separate regres-gression intercepts (ANCOVA)	0.010	5.86** (+3.8)	1, 188
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.006	1.42	6, 416
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.006	9.32***	1, 422
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.006	1.55	6, 423
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.002	2.84* (+2.5)	1, 429

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-38a

Regression Analysis and Analysis of Covariance Results for Prueba de Lectura Score--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.029	0.57	6, 111
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.000	0.04	1, 117
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.012	0.50	6, 228
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	0.005	1.27	1, 234
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.014	0.80	6, 325
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.003	1.22	1, 331
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.008	0.50	6, 332
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.002	0.70	1, 338

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

$^{*}\ p < .10$

$^{**}\ p < .05$

$^{***}\ p < .01$

$^{****}\ p < .001$

TABLE II-B-39a

Regression Analysis and Analysis of Covariance Results for Spanish as a Second Language Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.026	3.29***	6, 356
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.022	16.38**** (+3.6)	1, 362
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.048	9.30****	6, 497
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	.043	45.39**** (+4.0)	1, 503
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.009	2.10*	6, 606
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.005	7.33***	1, 612
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.416	9.53****	6, 613
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.036	45.30**** (+3.6)	1, 619

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-40a

Regression Analysis and Analysis of Covariance Results for Spanish as a Second Language Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.005	1.00	6, 965
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.006	8.18*** (+0.97)	1, 971
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.023	3.77***	6, 651
Title VII Without Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.000	0.16	1, 657
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.014	4.25	6, 1153
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.003	4.58**	1, 1159
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.008	2.28**	6, 1160
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.002	2.72* (+0.56)	1, 1166

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-A-41a

Regression Analysis and Analysis of Covariance Results for Spanish as a Second Language Score--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.002	0.47	6, 854
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.003	2.97* (+0.44)	1,860
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.016	3.12***	6, 837
Title VII Without Comparison, Non-Title VII	Separate regregression intercepts (ANCOVA)	0.000	0.02	1, 843
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.012	3.42***	6, 1210
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.001	1.00	1, 1216
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.005	1.45	6, 1217
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.000	0.76	1, 1223

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-42a

Regression Analysis and Analysis of Covariance Results for Spanish as a Second Language Score--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.014	1.89*	6, 233
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.000	0.03	1, 239
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.026	6.28****	6, 614
Title VII Without Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.003	4.20** (+1.0)	1, 620
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.007	1.91*	6, 726
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.000	0.48	1, 732
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.021	6.14****	6, 733
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.002	3.83*** (+0.92)	1, 739

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-43a

Regression Analysis and Analysis of Covariance Results for Spanish as a Second Language Score--Grade 6 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.018	0.73	6, 86
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.005	1.11	1, 92
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.028	4.31****	6, 319
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	.001	1.03	1, 325
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.009	1.52	6, 342
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.001	0.68	1, 348
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.025	4.20****	6, 349
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.001	0.66	1, 355

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-44a

Regression Analysis and Analysis of Covariance Results for Attitude Toward School Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.003	0.32	6, 564
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.025	15.85**** (+0.39)	1, 570
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.007	0.87	6, 705
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	0.001	0.63	1, 711
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.004	0.77	6, 989
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.020	22.11****	1, 995
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.004	0.80	6, 996
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.001	1.11	1, 1002

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-45a

Regression Analysis and Analysis of Covariance Results for Attitude Toward School Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.010	2.06*	6, 1092
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.000	0.10	1, 1098
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.008	1.17	6, 802
Title VII Without Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.000	0.11	1, 808
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.002	0.61	6, 1408
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.000	0.03	1, 1414
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.008	2.05*	6, 1415
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.000	0.09	1, 1421

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-46a

Regression Analysis and Analysis of Covariance Results
Attitude Toward School Score--Grade 4
Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.004	0.74	6, 965
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.000	0.34	1, 971
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.003	0.69	6, 975
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	0.001	0.75	1, 981
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.000	0.11	6,1432
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.000	0.05	1, 1438
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.003	0.89	6, 1439
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.000	0.77	1, 1445

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-47a

Regression Analysis and Analysis of Covariance Results for Attitude Toward School Score--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.007	0.41	6, 264
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.019	6.56** (+0.31)	1, 270
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.005	0.72	6, 730
Title VII Without Comparison, Non-Title VII	Separate regres-gression intercepts (ANCOVA)	.007	6.14** (+0.22)	1, 736
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.003	0.49	6, 861
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.001	0.98	1, 867
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.004	0.70	6, 868
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.007	7.40*** (+0.24)	1, 874

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-48a

Regression Analysis and Analysis of Covariance Results for Attitude Toward School Score--Grade 6 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.049	1.53	6, 102
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.065	11.83*** (+0.80)	1, 108
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.025	1.96*	6, 355
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	.005	2.33	1, 361
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.007	0.68	6, 393
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.020	11.22***	1, 399
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.023	2.09	6, 400
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.009	4.61** (+0.27)	1, 406

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-49a

Regression Analysis and Analysis of Covariance Results for Attitude Toward English Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.010	1.20	6, 565
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.002	1.26	1, 571
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.022	3.16***	6, 706
Title VII Without Comparison, Non-Title VII	Separate regres-gression intercepts (ANCOVA)	.006	4.96** (-0.2)	1, 712
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.003	0.65	6, 991
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.009	10.96***	1, 997
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.013	2.60**	6, 998
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.001	1.31	1, 1004

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-50a

Regression Analysis and Analysis of Covariance Results for Attitude Toward English Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.003	0.67	6, 1094
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.000	0.10	1, 1100
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.007	1.20	6, 804
Title VII Without Comparison, Non-Title VII	Separate regres-gression intercepts (ANCOVA)	.000	0.000	1, 810
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.004	1.12	6, 1410
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.000	0.17	1, 1416
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.003	0.95	6, 1417
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.000	0.09	1, 1423

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-51a

Regression Analysis and Analysis of Covariance Results for Attitude Toward English Score--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.016	3.75***	6, 965
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.004	5.87** (+0.14)	1, 971
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.009	2.24**	6, 975
Title VII Without Comparison, Non-Title VII	Separate regres-gression intercepts (ANCOVA)	0.003	3.81** (+0.11)	1, 981
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.013	4.66****	6, 1432
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.000	0.19	1, 1438
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.007	2.49**	6, 1439
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.003	5.34	1, 1445

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-52a

Regression Analysis and Analysis of Covariance Results for Attitude Toward English Score--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.014	0.94	6, 264
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.000	0.14	1, 270
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.010	1.88*	6, 730
Title VII Without Comparison, Non-Title VII	Separate regres-gression intercepts (ANCOVA)	0.003	3.05* (+0.15)	1, 736
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.004	0.82	6, 861
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.000	0.30	1, 867
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.008	1.77	6, 868
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.002	2.54	1, 874

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-53a

Regression Analysis and Analysis of Covariance Results for Attitude Toward English Score--Grade 6 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F^a	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.021	0.74	6, 102
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.402	18.37**** (+0.25)	13, 355
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.005	0.49	6, 355
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	.011	6.70*** (+0.31)	1, 361
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.012	1.35	6, 393
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.000	0.23	1, 399
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.003	0.39	6, 400
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.010	6.85*** (+0.30)	1, 406

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-54a

Regression Analysis and Analysis of Covariance Results for Attitude Toward Spanish Score--Grade 2 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.007	1.02	6, 656
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.032	26.32**** (+0.60)	1, 571
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.022	3.35***	6, 706
Title VII Without Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.003	2.60	1, 712
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.008	1.94*	6, 991
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.008	11.59***	1, 997
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.012	2.82**	6, 998
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.008	11.06*** (+0.32)	1, 1004

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-55a

Regression Analysis and Analysis of Covariance Results for Attitude Toward Spanish Score--Grade 3 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.004	0.88	6, 1094
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.014	20.62**** (+0.35)	1, 1100
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.009	1.64	6, 804
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	.007	7.51*** (+0.28)	1, 810
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.005	1.52	6, 1410
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.000	0.55	1, 1416
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.004	1.16	6, 1417
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.011	21.07**** (+0.33)	1, 1423

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** p .05
*** $p < .01$
**** $p < .001$

TABLE II-B-56a

Regression Analysis and Analysis of Covariance Results for Attitude Toward Spanish Score--Grade 4 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.003	0.67	6, 964
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.013	18.27**** (+0.31)	1, 970
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.003	0.70	6, 974
Title VII Without Comparison, Non-Title VII	Separate regres-gression intercepts (ANCOVA)	0.015	22.76**** (+0.34)	1, 980
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.003	1.03	6, 1431
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.000	0.09	1, 1437
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.002	0.66	6, 1438
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.014	30.46**** (+0.33)	1, 1444

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* p< .10
** p< .05
*** p< .01
**** p< .001

TABLE II-B-57a

Regression Analysis and Analysis of Covariance Results for Attitude Toward Spanish Score--Grade 5 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	0.003	0.23	6, 264
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.036	17.86**** (+0.53)	1, 270
Title VII Without Comparison, Non-Title VII	Separate regression slopes	0.008	1.53	6, 730
Title VII Without Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	0.004	4.35** (+0.20)	1, 736
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	0.003	0.79	6, 861
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	0.007	10.54***	1, 867
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	0.006	1.37	6, 868
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	0.005	7.56*** (+0.26)	1, 874

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$
** $p < .05$
*** $p < .01$
**** $p < .001$

TABLE II-B-58a

Regression Analysis and Analysis of Covariance Results for Attitude Toward Spanish Score--Grade 6 Hispanic Students, Spring 1976 Test Score Analysis

Treatment Groups	Source of Variance	Expanded Standard Scores		
		Proportion of Variance	F[a]	(df)
Title VII With Comparison, Non-Title VII	Separate regression slopes	.020	0.68	6, 102
Title VII With Comparison, Non-Title VII	Separate regression intercepts (ANCOVA)	.017	3.43* (+0.50)	1, 108
Title VII Without Comparison, Non-Title VII	Separate regression slopes	.018	1.93*	6, 355
Title VII Without Comparison, Non-Title VII	Separate regresgression intercepts (ANCOVA)	.002	1.09	1, 361
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression slopes for Title VII With Comparison and Title VII Without Comparison	.005	0.62	6, 393
Title VII With Comparison, Title VII Without Comparison, Non-Title VII	Separate regression intercepts for Title VII With Comparison and Title VII Without Comparison (ANCOVA)	.005	3.46*	1, 399
Title VII Pooled, Non-Title VII	Separate regression slopes for Title VII Pooled and Non-Title VII	.016	1.92*	6, 400
Title VII Pooled, Non-Title VII	Separate regression intercepts for Title VII Pooled and Non-Title VII (ANCOVA)	.003	2.05	1, 406

[a] The adjusted Title VII mean minus the adjusted Non-Title VII mean is shown in parentheses for significant differences.

* $p < .10$

** $p < .05$

*** $p < .01$

**** $p < .001$

TABLE II-B-59a

Contribution of Pretest Scores and Years of Prior Bilingual Education Experience to Prediction of Posttest Scores, for Hispanic Title VII Students--Grade 2

Test/Outcome	R^2 for Pretest + Years + Interaction	R^2 for Pretest Alone	Difference
Reading Total	.557	.556	.001
Reading Total Rescored	.502	.502	.000
Vocabulary	.501	.497	.004
Prueba de Lectura	.405	.400	.005
English as a Second Language	.455	.451	.004
Spanish as a Second Language	.569	.566	.003
Mathematics Computation	.292	.291	.001
Mathematics Total	.478	.476	.002
Attitude Toward School	.070	.065	.005
Attitude Toward English	.105	.105	.000
Attitude Toward Spanish	.243	.243	.000

TABLE II-B-60a

Contribution of Pretest Scores and Years of Prior Bilingual Education Experience to Prediction of Posttest Scores, for Hispanic Title VII Students--Grade 3

Test/Outcome	R^2 for Pretest + Years + Interaction	R^2 for Pretest Alone	Difference
Reading Total	.589	.588	.001
Reading Total Rescored	.598	.598	.000
Vocabulary	.532	.530	.002
Prueba de Lectura	.605	.602	.003
English as a Second Language	.454	.446	.008
Spanish as a Second Language	.401	.400	.001
Mathematics Computation	.312	.311	.001
Mathematics Total	.587	.587	.000
Attitude Toward School	.087	.078	.009
Attitude Toward English	.212	.209	.003
Attitude Toward Spanish	.239	.238	.001

TABLE II-B-61a

Contribution of Pretest Scores and Years of Prior Bilingual Education Experience to Prediction of Posttest Scores, for Hispanic Title VII Students--Grade 4

Test/Outcome	R^2 for Pretest + Years + Interaction	R^2 for Pretest Alone	Difference
Reading Total	.756	.754	.002
Reading Total Rescored	.756	.753	.003
Vocabulary	.693	.686	.007
Prueba de Lectura	.688	.686	.002
English as a Second Language	.437	.436	.001
Spanish as a Second Language	.439	.431	.008
Mathematics Computation	.511	.506	.005
Mathematics Total	.715	.715	.000
Attitude Toward School	.162	.156	.006
Attitude Toward English	.275	.275	.000
Attitude Toward Spanish	.374	.368	.006

TABLE II-B-62a

Contribution of Pretest Scores and Years of Prior Bilingual Education Experience to Prediction of Posttest Scores for Hispanic Title VII Students--Grade 5

Test/Outcome	R^2 for Pretest + Years + Interaction	R^2 for Pretest Alone	Difference
Reading Total	.592	.579	.013
Reading Total Recored	.593	.581	.012
Vocabulary	.655	.651	.004
Prueba de Lectura	.020	.012	.008
English as a Second Language	.566	.524	.042
Spanish as a Second Language	.637	.618	.019
Mathematics Computation	.453	.453	0
Mathematics Total	.615	.613	.002
Attitude Toward School	.151	.144	.007
Attitude Toward English	.341	.341	.000
Attitude Toward Spanish	.412	.410	.002

TABLE II-B-63a

Contribution of Pretest Scores and Years
of Prior Bilingual Education Experience
to Prediction of Posttest Scores,
for Hispanic Title VII Students--Grade 6

Test/Outcome	r^2 for Pretest + Years + Interaction	r^2 for Pretest Alone	Difference
Reading Total	.672	.670	.002
Reading Total Rescored	.674	.672	.002
Vocabulary	.655	.652	.003
Prueba de Lectura	.048	.033	.015
English as a Second Language	.719	.708	.011
Spanish as a Second Language	.725	.724	.001
Mathematics Computation	.457	.445	.012
Mathematics Total	.670	.669	.001
Attitude Toward School	.217	.216	.001
Attitude Toward English	.351	.350	.001
Attitude Toward Spanish	.417	.394	.023

APPENDIX III-C

SUPPORTING TABLES FOR CHAPTER III, SECTION C

TABLE III-C-1a

Classroom Level Educational Process Variables-- Range of Values, Description, and Response Alternatives

Process Variables	Number of Items	Possible Range of Values for Items	Description of Variable Items and Response Alternatives	EdExAG Location (page)
Average Teacher Hours per Student per Week	6		Total classroom teacher hours/week +Total team teacher hours/week +Total English specialist hours/week +Total Spanish specialist hours/week +Total math specialist hours/week Divided by total number of students	3
Average Adult Hours per Student per Week	35		Total time per week spent in classroom by: Teacher Aides Volunteers Cultural resources Librarians Counselors/psychologists Speech/hearing specialists Learning disabilities specialist ESL specialists Math specialists Curriculum specialists Community liaisons Media specialists Other consultants Divided by total number of students	3
English as a Second Language Is Taught	1	1-2	Presence of English as a Second Language instruction 1 = no 2 = yes	4-E
Spanish Language Arts Is Taught	1	1-2	Presence of Spanish Language Arts and Reading instruction 1 = no 2 = yes	6-9

(continued)

TABLE III-C-1a (continued)

Process Variables	Number of Items	Possible Range of Values for Items	Description of Variable Items and Response Alternatives	EdExAG Location (page)
Spanish as a Second Language	1	1-2	Presence of Spanish as a Second Language Instruction 1 = no 2 = yes	4-S
Whole-Class Instruction in English As a Percentage of Total English Instructional Time	12	0-100%	Number of students receiving 'whole-class' instruction in English Language Arts mulitiplied by total hours of whole class English Language Arts instruction per week, all divided by total hours spent per week on English Language Arts multiplied by number of students receiving English instruction.	4-E, 6E
Individualized Instruction in English As a Percentage of Total English Instructional Time	12	0-100%	Number of students receiving individualized instruction in English Language Arts multiplied by total hours of English individualized language arts instruction per week, (both for ESL and regular Reading and Language Arts instruction) all divided by total hours spent per week on English Language Arts multiplied by the total number of student receiving English Instruction.	4E and 6E
Group Instruction in English As a Percentage of Total English Instructional Time	12	1-100%	Number of students receiving group instruction in English Language Arts multiplied by total hours of group English Language Arts instruction per week, (both for ESL and regular Reading and Language Arts instruction) all divided by total hours spent per week on English Language Arts multiplied by the total number of students receiving English instruction.	4E and 6E

(continued)

TABLE III-C-1a (continued)

Process Variables	Number of Items	Possible Range of Values for Items	Description of Variable Items and Response Alternatives	EdExAG Location (page)
Average English Hours Per Student Per Week	13	--	Total hours spent per week on English Language Arts, Reading, and ESL multiplied by the number of students participating in English instruction divided by total class enrollment	4E 6E 2
Grouping Index for English	6	--	Total number of students recieving group instruction in English Language Arts, Reading, and ESL, divided by total number of instructional groups for English = average group size. Average group size multiplied by the number of groups formed for English instruction divided by the total class enrollment = grouping index. 0 = no grouping <1 = some children receive group instruction; the rest of the class receives whole-class or individualized instruction 1 = all children are grouped once for English >1 = multiple, complex grouping (e.g., grouped once for reading, again for oral language, again for spelling in English)	4E 6E 2
ESL As Percentage of Total English Time	4	0-100%	Total hours per week spent in English as a Second Language instruction multiplied by the number of students participating in ESL instruction, divided by total hours per week spent on all English Language instruction (Reading, Language Arts, and ESL)	4E 6E

(continued)

TABLE III-C-1a (continued)

Process Variables	Number of Items	Possible Range of Values for Items	Description of Variable Items and Response Alternatives	EdExAG Location (page)
Spanish Use Allowed in English Classes	1	0-3	Do you allow the use of Spanish in the English Language Arts instruction period? 0 = missing data 1 = no 2 = yes, when absolutely necessary 3 = yes, freely	12
Whole-Class Instruction in Spanish As Percentage of Total Spanish Instructional Time	12	0-100%	Number of students receiving 'whole class' instruction in Spanish Language Arts multiplied by total student hours of whole class Spanish Language Arts instruction per week (both for SSL and regular Spanish Reading and Language Arts) all divided by total hours spent per week on all Spanish Language Arts multiplied by number of students receiving Spanish instruction.	4S 6S
Individualized Instruction in Spanish As A Percentage of Total Spanish Instructional Time	12	0-100%	Number of students receiving individualized instruction in Spanish Language Arts multiplied by total student hours of individualized Spanish Language Arts instruction per week (both for SSL and regular Reading and Language Arts) all divided by total hours spent per week on Spanish Language Arts, multiplied by the total number of students receiving Spanish instruction.	4S 6S

(continued)

TABLE III-C-1a (continued)

Process Variables	Number of Items	Possible Range of Values for Items	Description of Variable Items and Response Alternatives	EdExAG Location (page)
Group Instruction in Spanish As a Percentage of Total Spanish Instruction Time	12	0-100%	Number of students receiving group instruction in Spanish Language Arts multiplied by total hours of grouped Spanish Language Arts instruction per week (both for SSL and regular Reading and Language Arts instruction) all divided by total hours spent per week on Spanish Language Arts multiplied by the total number of students receiving Spanish instruction.	4S 6S
Average Spanish Hours Per Student Per Week	13		Total hours spent per week on Spanish Language Arts, Reading, and SSL, multiplied by the number of students receiving Spanish instruction all divided by total class enrollment.	4S 6S 2
Grouping Index for Spanish	6		Total number of students receiving group instruction in Spanish Language Arts, Reading, and/or SSL divided by total number of instructional groups for Spanish = average group size. Average group size multiplied by the number of groups formed for Spanish instruction all divided by total class enrollment 0 = no grouping <1 = some children receive group instruction; the rest of the class receive whole-class or individualized instruction 1 = all children are grouped once for Spanish >1 = multiple, complex grouping (e.g., class is grouped once for reading, re-grouped for oral language; grouped again for spelling in Spanish) (continued)	4S 6S 2

399

TABLE III-C-1a (continued)

Process Variables	Number of Items	Possible Range of Values for Items	Description of Variable Items and Response Alternatives	EdExAG Location (page)
SSL As Percentage of Total Spanish Time	4	0-100%	Total hours per week spent in Spanish as a Second Language Instruction multiplied by the number of students participating in SSL instruction, divided by total hours per week spent on all Spanish Language instruction (Reading, Language Arts, and SSL)	4S 6S
English Use Allowed in Spanish Classes	1	0-3	Do you allow the use of English during the Spanish Language Arts instruction period? 0 = missing data 1 = no 2 = yes, when absolutely necessary 3 = yes, freely	12
Whole-Class Instruction in Math As A Percentage of Total Math Instructional Time	4	0-100%	Number of students receiving whole class instruction in Mathematics multiplied by the number of hours per week spent in whole class Mathematics instruction all divided by total hours spent per week in Mathematics muliplied by total number of students receiving Mathematics instruction	7
Individualized Instruction in Math As A Percentage of Total Math Instructional Time	4	0-100%	Number of students receiving individualized instruction in Mathematics multiplied by total student hours per week of individualized Mathematics instruction, all divided by total hours spent per week in Mathematics multiplied by total number of students receiving Mathematics instruction	

(continued)

TABLE III-C-1a (continued)

Process Variables	Number of Items	Possible Range of Values for Items	Description of Variable Items and Response Alternatives	EdExAG Location (page)
Group Instruction in Math As Percentage of Total Math Instructional Time	4	0-100%	Number of students receiving group instruction in Mathematics multiplied by total hours per week of grouped Mathematics instruction all divided by total hours spent per week on Mathematics multiplied by total number of students receiving Mathematics instruction.	7
Average Math Hours Per Student Per Week	7	--	Total hours spent per week on Mathematics, multiplied by the number of students receiving Mathematics Instruction all divided by total class enrollment	7 2
Grouping Index for Math	3		Total number of students receiving group instruction in Mathematics divided by total number of Mathematics groups = average group size. Average group size multiplied by the number of groups formed for Mathematics instruction All divided by total class enrollment 0 = no grouping <1 = some children received group instruction; the rest of the class receives whole-class or individualized instruction 1 = all children are grouped once for Math >1 = multiple, complex grouping (e.g., class is grouped once for computation instruction and is regrouped for concepts and application)	

(continued)

TABLE III-C-1a (continued)

Process Variables	Number of Items	Possible Range of Values for Items	Description of Variable Items and Response Alternatives	EdExAG Location (page)
Spanish Use Allowed in Math Class	1	0-3	Do you allow the use of Spanish during the Mathematics Instruction period? 0 = missing data 1 = no 2 = yes, when absolutely necessary 3 = yes, freely	

TABLE III-C-2a

Contextual Characteristics Variables--
Response Alternatives and Coded Values

Variable	Source	Response Alternatives for Categorical Variables	Coded Value
Home and Neighborhood use of English	Parent Questionnaire Item:8	Language used in home	
		1. Only Spanish	1
		2. Spanish more than English	2
		3. Spanish and English equally	3
		4. English more than Spanish	4
		5. Only English	5
	9	Language used in neighborhood	
		1. Only Spanish	1
		2. Spanish more than English	2
		3. Spanish and English equally	3
		4. English more than Spanish	4
		5. Only English	5
	10	Language used by parents with own children	
		1. Only Spanish	1
		2. Spanish more than English	2
		3. Spanish and English equally	3
		4. English more than Spanish	4
		5. Only English	5
	11	Language used by children with own parents	
		1. Only Spanish	1
		2. Spanish more than English	2
		3. Spanish and English equally	3
		4. English more than Spanish	4
		5. Only English	5

(continued)

TABLE III-C-2a (continued)

Variable	Source	Response Alternatives for Categorical Variables	Coded Value
Proportion of Hispanic Students	Data Base and Student Questionnaire (Teacher Completion) Item 2	From the students in Intensive Sample Classroom present for fall 1975 and spring 1976 testing, select the Hispanic students. Count the Hispanic students and divide by the total number of students for the classroom present fall and spring.	

TABLE III-C-3a

Teacher and Teacher Aide Characteristic Variables--
Response Alternatives and Coded Values

Variable	Item	Response Alternatives for Categorical Variables	Coded Value
Overall Teacher Qualifications and Overall Teacher Aide Qualifications	6	Highest college degree	
		1. No degree	1
		2. Degree/diploma in less than 4 years	2
		3. B.A./B.S.	3
		4. Teaching credential	3
		5. M.A. or higher	4
	7	Type of state teaching credential	
		1. Non-credentialed	1
		2. Temporary, provisional, partial-fulfillment or emergency credential	2
		3. Regular credential	3
		4. Bilingual-bicultural credential	4
	8	Years of full-time teaching experience	
		1. Less than 1 year	1
		2. 1 year	1
		3. 2 years	2
		4. 3 years	2
		5. 4 years	3
		6. 5-9 years	3
		7. 10-19 years	4
		8. 20-29 years	4
		9. 30 or more years	4

(continued)

TABLE III-C-3a (continued)

Variable	Item	Response Alternatives for Categorical Variables	Coded Value
Teacher Non-Classroom Use of English and Teacher Aide Non-Classroom Use of English	1	Language used in home	
		1. Only Spanish	1
		2. Spanish more than English	2
		3. Spanish and English equally	3
		4. English more than Spanish	4
		5. Only English	5
	2	Language used with own children	
		1. Only Spanish	1
		2. Spanish more than English	2
		3. Spanish and English equally	3
		4. English more than Spanish	4
		5. Only English	5
		6. No children	0
	4	Language used with bilingual friends	
		1. Only Spanish	1
		2. Spanish more than English	2
		3. Spanish and English equally	3
		4. English more than Spanish	4
		5. Only English	5
	17	Language judged proficiency as a child	
		1. Spanish	1
		2. Both Spanish and English	3
		3. English	5
		4. Other	0

(continued)

TABLE III-C-3a (continued)

Variable	Item	Response Alternatives for Categorical Variables	Coded Value
(continued)	18	Judged language proficiency as a teenager	
		1. Spanish	1
		2. Both Spanish and English	3
		3. English	5
		4. Other	0
	19	Judged present language proficiency	
		1. Spanish	1
		2. Both Spanish and English	3
		3. English	5
		4. Other	0
Teacher Non-Classroom Use of Spanish and Teacher Aide Non-Classroom Use of Spanish	1	Language used in home	
		1. Only Spanish	5
		2. Spanish more than English	4
		3. Spanish and English equally	3
		4. English more than Spanish	2
		5. Only English	1
	2	Language used with own children	
		1. Only Spanish	5
		2. Spanish more than English	4
		3. Spanish and English equally	3
		4. English more than Spanish	2
		5. Only English	1
		6. No children	0

(continued)

TABLE III-C-3a (continued)

Variable	Item	Response Alternatives for Categorical Variables	Coded Value
(continued)	4	Language used with bilingual friends	
		1. Only Spanish	5
		2. Spanish more than English	4
		3. Spanish and English equally	3
		4. English more than Spanish	2
		5. Only English	1
	17	Judged language proficiency as a child	
		1. Spanish	5
		2. Both Spanish and English	3
		3. English	1
		4. Other	0
	18	Judged language proficiency as a teenager	
		1. Spanish	5
		2. Both Spanish and English	3
		3. English	1
		4. Other	0
	19	Judged present language proficiency	
		1. Spanish	5
		2. Both Spanish and English	3
		3. English	1
		4. Other	0
		(continued)	

TABLE III-C-3a (continued)

Variable	Item	Response Alternatives for Categorical Variables	Coded Value
Teacher Bilinguality and Teacher Aide Bilinguality	1	Language used in home	
		1. Only Spanish	1
		2. Spanish more than English	3
		3. Spanish and English equally	5
		4. English more than Spanish	3
		5. Only English	1
	2	Language used with own children	
		1. Only Spanish	1
		2. Spanish more than English	3
		3. Spanish and English equally	5
		4. English more than Spanish	3
		5. Only English	1
		6. No children	0
	4	Language used with bilingual friends	
		1. Only Spanish	1
		2. Spanish more than English	3
		3. Spanish and English equally	5
		4. English more than Spanish	3
		5. Only English	1
	17	Judged language proficiency as a child	
		1. Spanish	1
		2. Both Spanish and English	5
		3. English	1
		4. Other	0
		(continued)	

TABLE III-C-3a (continued)

Variable	Item	Response Alternatives for Categorical Variables	Coded Value
(continued)	18	Judged language proficiency as a teacher	
		1. Spanish	1
		2. Both Spanish and English	5
		3. English	1
		4. Other	0
	19	Judged present language proficiency	
		1. Spanish	1
		2. Both Spanish and English	5
		3. English	1
		4. Other	0
Bilingual Teacher Qualifications and Bilingual Teacher Aide Qualifications	31	Years of teaching in a bilingual program	
		1. Less than 1 year	1
		2. 1 year	2
		3. 2 years	3
		4. 3 years	4
		5. 4 years	4
		6. 5 years	5
		7. More than 5 years	5
	32	College training in bilingual education	
		1. 1-5 quarter units (1-3 semester hours)	2
		2. 6-15 quarter units (4-10 semester hours)	3
		3. 16-30 quarter units (11-20 semester hours)	4
		4. More than 30 quarter units (more than 20 semester hours)	5
		5. No college training in bilingual education	1

(continued)

TABLE III-C-3a (continued)

Variable	Item	Response Alternatives for Categorical Variables	Coded Value
(continued)	33	Inservice training in bilingual education	
		1. 1 day or less	2
		2. 2-15 days	3
		3. 15-30 days	4
		4. More than 30 days	5
		5. No inservice training	1
	34	Attendance at conferences on bilingual education	
		1. 1 day or less	2
		2. 2-15 days	3
		3. 15-30 days	4
		4. More than 30 days	5
		5. No conferences attended	1

TABLE III-C-4a

Student Questionnaire Outcome Variables-- Response Alternatives and Coded Values

Variable	Item	Response Alternatives for Categorical Variables	Coded Value
Attitude Toward School	14	How do you like school?	
		1. A lot	8
		2. It's O.K.	6
		3. Not much	4
		4. I don't like it at all	2
	30	When I'm at school in the classroom, I feel	
		1. Neither good nor bad	5
		2. Good/happy	8
		3. Does not apply/can't answer	5
		4. Bad/unhappy	2
	31	When I'm at school in the playground, I feel	
		1. Bad/unhappy	2
		2. Neither good nor bad	5
		3. Good/happy	8
		4. Does not apply/can't answer	5
	43	When I'm in the classroom studying in a group, I feel	
		1. Good/happy	8
		2. Bad/unhappy	2
		3. Neither good nor bad	5
		4. Does not apply/can't answer	5
	44	When I'm in the classroom studying by myself, I feel	
		1. Good/happy	8
		2. Bad/unhappy	2
		3. Neither good nor bad	5
		4. Does not apply/can't answer	5
		(continued)	

TABLE III-C-4a (continued)

Variable	Item	Response Alternatives for Categorical Variables	Coded Value
Attitude Toward English	4	I like to speak English	
		1. A lot	8
		2. It's O.K.	6
		3. Not much	4
		4. I don't like it at all	2
		5. I don't speak English	0
	6	I like doing songs, dances, and plays in English	
		1. A lot	8
		2. It's O.K.	6
		3. Not much	4
		4. I don't like them at all	2
		5. We don't do English songs, dances, or plays	0
	8	I like reading in English	
		1. A lot	8
		2. It's O.K.	6
		3. Not much	4
		4. I don't like it at all	2
		5. I don't read in English	0
	16	How do you like learning English?	
		1. A lot	8
		2. It's O.K.	6
		3. Not much	4
		4. I don't like it at all	2
		5. I'm not learning English	0

(continued)

TABLE III-C-4a (continued)

Variable	Item	Response Alternatives for Categorical Variables	Coded Value
Attitude Toward English (continued)	26	When I am learning about English-speaking people, I feel	
		1. Neither good nor bad	5
		2. Good/happy	8
		3. Does not apply/can't answer	0
		4. Bad/unhappy	2
	33	When I'm with classmates who speak English, I feel	
		1. Good/happy	8
		2. Sad/unhappy	2
		3. Neither good nor bad	5
		4. Does not apply/can't answer	0
	36	At school, when I speak English, I feel	
		1. Neither good nor bad	5
		2. Good/happy	8
		3. Does not apply/can't answer	0
		4. Bad/unhappy	2
	40	When the teacher speaks to me in English, I feel	
		1. Neither good nor bad	5
		2. Good/happy	8
		3. Does not apply/can't answer	0
		4. Bad/unhappy	2
	42	When the teacher's helper speaks to me in English, I feel	
		1. Good/happy	8
		2. Bad/unhappy	2
		3. Neither good nor bad	5
		4. Does not apply/can't answer	0
		(continued)	

TABLE III-C-4a (continued)

Variable	Item	Response Alternatives for Categorical Variables	Coded Value
Attitude Toward Spanish	3	I like to speak Spanish	
		1. A lot	8
		2. It's O.K.	6
		3. Not much	4
		4. I don't like it at all	2
		5. I don't speak Spanish	0
	5	I like doing songs, dances, and plays in Spanish	
		1. A lot	8
		2. It's O.K.	6
		3. Not much	4
		4. I don't like them at all	2
		5. We don't do Spanish songs, dances, and plays	0
	7	I like reading in Spanish	
		1. A lot	8
		2. It's O.K.	6
		3. Not much	4
		4. I don't like it at all	2
		5. I don't read in Spanish	0
	15	How do you like learning Spanish?	
		1. A lot	8
		2. It's O.K.	6
		3. Not much	4
		4. I don't like it at all	2
		5. I'm not learning Spanish	0
		(continued)	

TABLE III-C-4a (continued)

Variable	Item	Response Alternatives for Categorical Variables	Coded Value
Attitude Toward Spanish (continued)	25	When I am learning about Spanish-speaking people, I feel	
		1. Bad/unhappy	2
		2. Neither good nor bad	5
		3. Good/happy	8
		4. Does not apply/can't answer	0
	32	When I'm with classmates who speak only Spanish, I feel	
		1. Does not apply/can't answer	0
		2. Bad/unhappy	2
		3. Neither good nor bad	5
		4. Good/happy	8
	35	At school when I speak Spanish, I feel	
		1. Good/happy	8
		2. Bad/unhappy	2
		3. Neither good nor bad	5
		4. Does not apply/can't answer	0
	39	When the teacher speaks to me in Spanish, I feel	
		1. Good/happy	8
		2. Sad/unhappy	2
		3. Neither good nor bad	5
		4. Does not apply/can't answer	0
		(continued)	

TABLE III-C-4a (continued)

Variable	Item	Response Alternatives for Categorical Variables	Coded Value
Attitude Toward Spanish (continued)	41	When the teacher's helper speaks to me in Spanish, I feel 1. Good/happy 2. Sad/unhappy 3. Neither good nor bad 4. Does not apply/can't answer	 8 2 5 0

APPENDIX III-D

SUPPORTING TABLES FOR CHAPTER III, SECTION D

TABLE III-D-1a

Standardized Gain Score Analysis for English Language Arts Educational Processes--Grade 2

Process Variables	Outcomes						
	CTBS Reading Total Score	CTBS Reading Total Score Rescored	CTBS Reading Vocabulary Score	ESL Test Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Average Teacher Hours Per Student Per Week	ns	ns	ns	ns	ns	ns	ns
Average Adult Hours Per Student Per Week	ns	ns	ns	ns	-.15**	ns	ns
ESL is Taught	ns	ns	ns	ns	ns	ns	ns
Whole Class Instruction in English as a Percent of Total English Instructional Time	ns	ns	ns	ns	ns	ns	ns
Individual Instruction in English as a Percent of Total English Instructional Time	ns	ns	ns	ns	ns	ns	ns
Group Instruction in English as a Percent of Total English Instructional Time	ns	ns	ns	ns	ns	ns	ns
Average English Hours Per Student Per Week	.18**	.14**	.15**	ns	ns	ns	ns
Grouping Index for English	ns	ns	ns	ns	ns	ns	.12*
ESL as a Percent of Total English Time	ns	ns	ns	ns	ns	ns	ns
Spanish Use Allowed in English Classes	ns	ns	ns	ns	ns	ns	-.14*

Level of significance:
ns = not significant
* = p < .01
** = p < .001

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data.

TABLE III-D-2a

Standardized Gain Score Analysis for English Language Arts Educational Processes--Grade 3

Process Variables	Outcomes						
	CTBS Reading Total Score	CTBS Reading Total Score Rescored	CTBS Reading Vocabulary Score	ESL Test Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Average Teacher Hours Per Student Per Week	ns	ns	ns	ns	ns	ns	ns
Average Adult Hours Per Student Per Week	ns	ns	ns	ns	ns	ns	ns
ESL is Taught	ns	ns	ns	ns	ns	ns	ns
Whole Class Instruction in English as a Percent of Total English Instructional Time	ns	ns	ns	ns	ns	ns	ns
Individual Instruction in English as a Percent of Total English Instructional Time	ns	ns	ns	ns	ns	ns	ns
Group Instruction in English as a Percent of Total English Instructional Time	ns	ns	ns	ns	ns	ns	ns
Average English Hours Per Student Per Week	ns	ns	ns	ns	ns	ns	ns
Grouping Index for English	.09**	.09**	.08*	ns	ns	ns	ns
ESL as a Percent of Total English Time	ns	ns	ns	ns	ns	ns	ns
Spanish Use Allowed in English Classes	ns	ns	ns	ns	ns	ns	ns

Level of significance:
ns = not significant
* = p< .01
** = p< .001

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data.

TABLE III-D-3a

Standardized Gain Score Analysis for English Language Arts Educational Processes--Grade 4

Process Variables	Outcomes						
	CTBS Reading Total Score	CTBS Reading Total Score Rescored	CTBS Reading Vocabulary Score	ESL Test Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Average Teacher Hours Per Student Per Week	ns	ns	ns	ns	ns	ns	ns
Average Adult Hours Per Student Per Week	ns	ns	ns	ns	ns	ns	ns
ESL is Taught	ns	ns	ns	ns	ns	ns	ns
Whole Class Instruction in English as a Percent of Total English Instructional Time	-.10**	-.10**	-.08**	ns	ns	ns	ns
Individual Instruction in English as a Percent of Total English Instructional Time	.16**	.16**	.16**	ns	ns	ns	ns
Group Instruction in English as a Percent of Total English Instructional Time	.06*	.06*	ns	ns	ns	ns	ns
Average English Hours Per Student Per Week	.07**	.08**	ns	ns	ns	ns	ns
Grouping Index for English	.16**	.16**	.13**	ns	ns	ns	ns
ESL as a Percent of Total English Time	ns	ns	ns	ns	ns	ns	ns
Spanish Use Allowed in English Classes	ns	ns	ns	ns	ns	.12*	ns

Level of significance:
ns = not significant
* = $p < .01$
** = $p < .001$

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data.

TABLE III-D-4a

Standardized Gain Score Analysis for English Language Arts Educational Processes--Grade 5

Process Variables	Outcomes						
	CTBS Reading Total Score	CTBS Reading Total Score Rescored	CTBS Reading Vocabulary Score	ESL Test Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Average Teacher Hours Per Student Per Week	-.17**	-.16**	ns	ns	ns	.13*	ns
Average Adult Hours Per Student Per Week	-.12**	-.11*	ns	ns	ns	ns	ns
ESL is Taught	ns	ns	ns	ns	ns	ns	ns
Whole Class Instruction in English as a Percent of Total English Instructional Time	ns	ns	ns	ns	ns	ns	ns
Individual Instruction in English as a Percent of Total English Instructional Time	ns	ns	ns	ns	ns	ns	ns
Group Instruction in English as a Percent of Total English Instructional Time	ns	ns	ns	ns	ns	ns	ns
Average English Hours Per Student Per Week	-.17**	-.17**	-.10*	ns	ns	ns	ns
Grouping Index for English	.12**	.12**	ns	ns	ns	ns	ns
ESL as a Percent of Total English Time	ns	ns	ns	ns	ns	ns	ns
Spanish Use Allowed in English Classes	ns	ns	ns	ns	ns	ns	ns

Level of significance:
ns = not significant
* = p < .01
** = p < .001

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data.

TABLE III-D-5a

Standardized Gain Score Analysis for English Language Arts Educational Processes--Grade 6

Process Variables	Outcomes						
	CTBS Reading Total Score	CTBS Reading Total Score Rescored	CTBS Reading Vocabulary Score	ESL Test Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Average Teacher Hours Per Student Per Week	ns	ns	ns	ns	ns	ns	ns
Average Adult Hours Per Student Per Week	ns	ns	ns	ns	ns	ns	ns
ESL is Taught	ns	ns	ns	ns	ns	ns	ns
Whole Class Instruction in English as a Percent of Total English Instructional Time	ns	ns	ns	ns	ns	ns	ns
Individual Instruction in English as a Percent of Total English Instructional Time	ns	ns	ns	ns	ns	ns	ns
Group Instruction in English as a Percent of Total English Instructional Time	ns	ns	ns	ns	ns	ns	ns
Average English Hours Per Student Per Week	ns	ns	ns	ns	ns	ns	ns
Grouping Index for English	ns	ns	ns	ns	ns	ns	ns
ESL as a Percent of Total English Time	ns	ns	ns	ns	ns	ns	ns
Spanish Use Allowed in English Classes	ns	ns	ns	ns	ns	ns	ns

Level of significance:
ns = not significant
* = $p < .01$
** = $p < .001$

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data.

TABLE III-D-6a

Standardized Gain Score Analysis for Educational
Processes in Mathematics--Grade 2

Process Variables	Outcomes	
	CTBS Mathematics Computation Score	CTBS Mathematics Total Score
Average Teacher Hours Per Student Per Week	ns	ns
Average Adult Hours Per Student Per Week	ns	ns
Whole-Class Instruction in Math as a Percentage of Total Math Instruction Time	-0.12**	ns
Individualized Instruction as a Percentage of Total Math Instruction Time	0.09*	0.09*
Group Instruction as a Percentage of Total Math Instruction Time	ns	ns
Average Math Hours Per Student Per Week	0.11*	ns
Grouping Index in Math	ns	ns
Spanish Use Permitted in Math Class	0.12**	ns

Level of significance:
ns = not significant
* = $p < .01$
** = $p < .001$

TABLE III-D-7a

Standardized Gain Score Analysis for Educational Processes in Mathematics--Grade 3

Process Variables	Outcomes	
	CTBS Mathematics Computation Score	CTBS Mathematics Total Score
Average Teacher Hours Per Student Per Week	0.08*	ns
Average Adult Hours Per Student Per Week	ns	ns
Whole-Class Instruction in Math as a Percentage of Total Math Instruction Time	ns	ns
Individualized Instruction as a Percentage of Total Math Instruction Time	ns	ns
Group Instruction as a Percentage of Total Math Instruction Time	ns	ns
Average Math Hours Per Student Per Week	ns	ns
Grouping Index in Math	ns	ns
Spanish Use Permitted in Math Class	ns	ns

Level of significance:
ns = not significant
* = $p < .01$
** = $P < .001$

TABLE III-D-8a

Standardized Gain Score Analysis for Educational Processes in Mathematics--Grade 4

Process Variables	Outcomes	
	CTBS Mathematics Computation Score	CTBS Mathematics Total Score
Average Teacher Hours Per Student Per Week	-0.09**	-0.07**
Average Adult Hours Per Student Per Week	-0.08*	ns[a]
Whole-Class Instruction in Math as a Percentage of Total Math Instruction Time	ns	ns
Individualized Instruction as a Percentage of Total Math Instruction Time	0.07*	0.08**
Group Instruction as a Percentage of Total Math Instruction Time	ns	ns
Average Math Hours Per Student Per Week	0.08*	0.08**
Grouping Index in Math	-0.07*	ns
Spanish Use Permitted in Math Class	ns	ns

Level of significance:
ns = not significant
* = $p < .01$
** = $p < .001$

430

TABLE III-D-9a

Standardized Gain Score Analysis for Educational Processes in Mathematics--Grade 5

Process Variables	Outcomes	
	CTBS Mathematics Computation Score	CTBS Mathematics Total Score
Average Teacher Hours Per Student Per Week	0.18**	0.17**
Average Adult Hours Per Student Per Week	0.18**	0.20**
Whole-Class Instruction in Math as a Percentage of Total Math Instruction Time	-0.16**	-0.18**
Individualized Instruction as a Percentage of Total Math Instruction Time	ns	ns
Group Instruction as a Percentage of Total Math Instruction Time	0.15**	0.17**
Average Math Hours Per Student Per Week	-0.11*	-0.11*
Grouping Index in Math	0.16**	0.17**
Spanish Use Permitted in Math Class	ns	ns

Level of significance:
ns = not significant
* = $p < .01$
** = $P < .001$

TABLE III-10a

Standardized Gain Score Analysis for Educational Processes in Mathematics--Grade 6

Process Variables	Outcomes	
	CTBS Mathematics Computation Score	CTBS Mathematics Total Score
Average Teacher Hours Per Student Per Week	ns	ns
Average Adult Hours Per Student Per Week	ns	ns
Whole-Class Instruction in Math as a Percentage of Total Math Instruction Time	-.12*	ns
Individualized Instruction as a Percentage of Total Math Instruction Time	-.12*	ns
Group Instruction as a Percentage of Total Math Instruction Time	0.15**	ns
Average Math Hours Per Student Per Week	ns	ns
Grouping Index in Math	0.15**	0.11*
Spanish Use Permitted in Math Class	ns	ns

Level of significance:
ns = not significant
* = $p < .01$
** = $p < .001$

432

TABLE III-D-11a

Standardized Gain Score Analysis for Educational Processes in Spanish Language Arts--Grade 2

Process Variables	Outcomes				
	SSL Test Score	Prueba de Lectura Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Average Teacher Hours Per Student Per Week	-.17**	ns	ns	ns	ns
Average Adult Hours Per Student Per Week	ns	ns	-.15**	ns	ns
Spanish Language Arts is Taught	ns	ns	ns	ns	.17**
Spanish as a Second Language is Taught	ns	ns	ns	ns	.11*
Whole-Class Instruction in Spanish as a Percentage of Total Spanish Instructional Time	ns	ns	ns	ns	ns
Individualized Instruction in Spanish as a Percentage of Total Spanish Instruction Time	ns	ns	ns	ns	ns
Group Instruction in Spanish as a Percentage of Total Spanish Instruction Time	ns	ns	ns	ns	.14**
Average Spanish Hours Per Student Per Week	.16**	ns	ns	ns	.15**
Grouping Index for Spanish	.13*	ns	ns	ns	.14**
SSL as a Percentage of Total Spanish Time	ns	ns	ns	ns	.12*
English Use Allowed in Spanish Classes	ns	ns	ns	ns	ns

Level of significance
ns = not significant
* = $p < .01$
** = $p < .001$

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data.

TABLE III-D-12a

Standardized Gain Score Analysis for Educational Processes in Spanish Language Arts--Grade 3

Process Variables	Outcomes				
	SSL Test Score	Prueba de Lectura Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Average Teacher Hours Per Student Per Week	ns	ns	ns	ns	ns
Average Adult Hours Per Student Per Week	ns	ns	ns	ns	ns
Spanish Language Arts is Taught	ns	ns	ns	ns	ns
Spanish as a Second Language is Taught	ns	ns	ns	ns	ns
Whole-Class Instruction in Spanish as a Percentage of Total Spanish Instructional Time	ns	ns	ns	ns	ns
Individualized Instruction in Spanish as a Percentage of Total Spanish Instruction Time	ns	ns	ns	ns	ns
Group Instruction in Spanish as a Percentage of Total Spanish Instruction Time	ns	ns	ns	ns	ns
Average Spanish Hours Per Student Per Week	.13**	ns	ns	ns	ns
Grouping Index for Spanish	.10*	ns	ns	ns	ns
SSL as a Percentage of Total Spanish Time	ns	ns	ns	ns	ns
English Use Allowed in Spanish Classes	ns	ns	ns	ns	ns

Level of significance
ns = not significant
* = p < .01
** = p < .001

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data.

TABLE III-D-13a

Standardized Gain Score Analysis for Educational Processes in Spanish Language Arts--Grade 4

Process Variables	Outcomes SSL Test Score	Prueba de Lectura Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Average Teacher Hours Per Student Per Week	-.09*	ns	ns	ns	ns
Average Adult Hours Per Student Per Week	ns	ns	ns	ns	ns
Spanish Language Arts is Taught	.18**	.15*	ns	ns	ns
Spanish as a Second Language is Taught	ns	ns	ns	ns	ns
Whole-Class Instruction in Spanish as a Percentage of Total Spanish Instructional Time	.13**	ns	ns	ns	ns
Individualized Instruction in Spanish as a Percentage of Total Spanish Instruction Time	b	b	b	b	b
Group Instruction in Spanish as a Percentage of Total Spanish Instruction Time	ns	ns	ns	ns	ns
Average Spanish Hours Per Student Per Week	.16**	ns	ns	ns	ns
Grouping Index for Spanish	.10*	ns	ns	ns	ns
SSL as a Percentage of Total Spanish Time	ns	ns	ns	ns	ns
English Use Allowed in Spanish Classes	ns	ns	ns	ns	ns

Level of significance
ns = not significant
* = $p < .01$
** = $p < .001$

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data.

TABLE III-D-14a

Standardized Gain Score Analysis for Educational Processes in Spanish Language Arts--Grade 5

Process Variables	Outcomes				
	SSL Test Score	Prueba de Lectura Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Average Teacher Hours Per Student Per Week	ns	-.40**	ns	.13*	ns
Average Adult Hours Per Student Per Week	ns	ns	ns	ns	ns
Spanish Language Arts is Taught	ns	ns	ns	ns	ns
Spanish as a Second Language is Taught	ns	ns	ns	ns	ns
Whole-Class Instruction in Spanish as a Percentage of Total Spanish Instructional Time	ns	ns	ns	ns	ns
Individualized Instruction in Spanish as a Percentage of Total Spanish Instruction Time	b	b	b	b	b
Group Instruction in Spanish as a Percentage of Total Spanish Instruction Time	ns	ns	ns	ns	ns
Average Spanish Hours Per Student Per Week	ns	ns	ns	ns	ns
Grouping Index for Spanish	ns	.44**	ns	ns	ns
SSL as a Percentage of Total Spanish Time	ns	ns	ns	ns	ns
English Use Allowed in Spanish Classes	-.13**	.36*	ns	-.20**	ns

Level of significance
ns = not significant
* = $p < .01$
** = $p < .001$

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data.

TABLE III-D-15a

Standardized Gain Score Analysis for Educational Processes in Spanish Language Arts--Grade 6

Process Variables	Outcomes				
	SSL Test Score	Prueba de Lectura Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Average Teacher Hours Per Student Per Week	ns	-.34**	ns	ns	ns
Average Adult Hours Per Student Per Week	ns	ns	ns	ns	ns
Spanish Language Arts is Taught	.09*	ns	ns	ns	.19*
Spanish as a Second Language is Taught	ns	.38**	ns	ns	ns
Whole-Class Instruction in Spanish as a Percentage of Total Spanish Instructional Time	ns	ns	ns	ns	ns
Individualized Instruction in Spanish as a Percentage of Total Spanish Instruction Time	b	b	b	b	b
Group Instruction in Spanish as a Percentage of Total Spanish Instruction Time	ns	ns	ns	ns	ns
Average Spanish Hours Per Student Per Week	ns	ns	ns	ns	ns
Grouping Index for Spanish	.11**	.29*	ns	ns	.19*
SSL as a Percentage of Total Spanish Time	ns	ns	ns	ns	ns
English Use Allowed in Spanish Classes	ns	ns	ns	ns	ns

Level of significance
ns = not significant
* = $p < .01$
** = $p < .001$

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data.

TABLE III-D-16a

Standardized Gain Score Analysis for Contextual Characteristics--Grade 2

	OUTCOMES										
Contextual Characteristics	CTBS Reading Total Score	CTBS Reading Total Score Rescored	CTBS Reading Vocabulary Score	ESL Test Score	SSL Test Score	Prueba de Lectura Score	CTBS Math Computation Score	CTBS Math Total Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Home and Neighborhood Use of English	ns	ns	ns	ns	ns	ns	NA[a]	NA[a]	ns	ns	ns
Proportion of Hispanic Students in Classroom	ns	ns	ns	ns	ns	-.17**	-.11**	ns	ns	.12*	-.13**

Level of significance:
ns = not significant
* = p < .01
** = p < .001

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data.

TABLE III-D-17a

Standardized Gain Score Analysis for Contextual Characteristics--Grade 3

	OUTCOMES										
Contextual Characteristics	CTBS Reading Total Score	CTBS Reading Total Score Rescored	CTBS Reading Vocabulary Score	ESL Test Score	SSL Test Score	Prueba de Lectura Score	CTBS Math Computation Score	CTBS Math Total Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Home and Neighborhood Use of English	ns	ns	ns	ns	-.19**[a]	ns	NA[a]	NA[a]	ns	ns	-.13*
Proportion of Hispanic Students in Classroom	ns	ns	ns	ns	+20**	ns	.09*	ns	ns	ns	ns

Level of significance:
ns = not significant
* = p < .01
** = p < .001

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data

TABLE III-D-18a

Standardized Gain Score Analysis for Contextual Characteristics--Grade 4

Contextual Characteristics	OUTCOMES										
	CTBS Reading Total Score	CTBS Reading Total Score Rescored	CTBS Reading Vocabulary Score	ESL Test Score	SSL Test Score	Prueba de Lectura Score	CTBS Math Computation Score	CTBS Math Total Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Home and Neighborhood Use of English	ns	ns	ns	ns	-.11*	ns	NA[a]	NA[a]	ns	ns	ns
Proportion of Hispanic Students in Classroom	-.09**	-.11**	-.12**	ns	.12**	ns	ns	-.07**	ns	ns	ns

Level of significance:
ns = not significant
* = p < .01
** = p < .001

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data

TABLE III-D-19a

Standardized Gain Score Analysis for Contextual Characteristics--Grade 5

Contextual Characteristics	OUTCOMES										
	CTBS Reading Total Score	CTBS Reading Total Score Rescored	CTBS Reading Vocabulary Score	ESL Test Score	SSL Test Score	Prueba de Lectura Score	CTBS Math Computation Score	CTBS Math Total Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Home and Neighborhood Use of English	ns	ns	ns	ns	ns	ns	NA[a]	NA[a]	ns	ns	ns
Proportion of Hispanic Students in Classroom	.14**	.15**	.15**	ns	ns	ns	.12*	ns	ns	ns	ns

Level of significance:
ns = not significant
* = p < .01
** = p < .001

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data

TABLE III-D-20a

Standardized Gain Score Analysis for Contextual Characteristics--Grade 6

	OUTCOMES										
Contextual Characteristics	CTBS Reading Total Score	CTBS Reading Total Score Rescored	CTBS Reading Vocabulary Score	ESL Test Score	SSL Test Score	Prueba de Lectura Score	CTBS Math Computation Score	CTBS Math Total Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Home and Neighborhood Use of English	ns	ns	ns	ns	ns	ns	NA[a]	NA[a]	ns	ns	ns
Proportion of Hispanic Students in Classroom	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data

Level of significance:
ns = not significant
* = $p < .01$
** = $p < .001$

TABLE III-D-21a

Standardized Gain Score Analysis for Teacher/Teacher Aide Characteristics--Grade 2[a]

	OUTCOMES										
Teacher/ Teacher Aide Characteristics	CTBS Reading Total Score	CTBS Reading Total Score Rescored	CTBS Reading Vocabulary Score	ESL Test Score	SSL Test Score	Prueba de Lectura Score	CTBS Math Computation Score	CTBS Math Total Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Overall Teacher Qualifications	ns	ns	ns	ns	ns	ns	-.12**	ns	ns	ns	ns
Non-Classroom Teacher Use of English	ns	ns	ns	-.20**	ns	ns	ns	-.09**	ns	ns	ns
Non-Classroom Teacher Use of Spanish	ns	ns	ns	.19*	ns	ns	ns	.09*	ns	ns	ns
Teacher Bilinguality	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Bilingual Teacher Qualifications	ns	ns	ns	ns	ns	ns	.11*	ns	ns	ns	ns
Overall Aide Qualifications	ns	ns	ns	ns	-.14*	ns	ns	ns	ns	ns	ns
Non-Classroom Aide Use of English	ns	ns	ns	ns	ns	ns	ns	ns	-.16*	ns	ns
Non-Classroom Aide Use of Spanish	ns	ns	ns	ns	ns	ns	ns	ns	.15*	ns	ns
Aide Bilinguality	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Aide Bilingual Teacher Qualifications	ns	ns	ns	-.25**	ns	ns	ns	ns	.16*	ns	.16*

Level of significance:
ns = not significant
* = p < .01
** = p < .001

[a] NA - Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data

TABLE III-D-22a

Standardized Gain Score Analysis for Teacher/Teacher Aide Characteristics--Grade 3[a]

Teacher/ Teacher Aide Characteristics	OUTCOMES										
	CTBS Reading Total Score	CTBS Reading Total Score Rescored	CTBS Reading Vocabulary Score	ESL Test Score	SSL Test Score	Prueba de Lectura Score	CTBS Math Computation Score	CTBS Math Total Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Overall Teacher Qualifications	ns	ns	ns	ns	ns	ns	-.16**	-.10**	ns	ns	ns
Non-Classroom Teacher Use of English	ns	ns	ns	ns	ns	-.13*	ns	ns	ns	ns	ns
Non-Classroom Teacher Use of Spanish	ns	ns	ns	ns	ns	.13*	ns	ns	.12*	ns	ns
Teacher Bilinguality	ns	ns	ns	ns	.16**	ns	ns	ns	.14*	ns	ns
Bilingual Teacher Qualifications	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Overall Aide Qualifications	ns	ns	ns	ns	-.14*	ns	ns	-.10*	ns	ns	ns
Non-Classroom Aide Use of English	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Non-Classroom Aide Use of Spanish	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Aide Bilinguality	ns	ns	ns	ns	ns	ns	.17**	.12**	.17*	ns	ns
Aide Bilingual Teacher Qualifications	ns	ns	ns	ns	-.16*	ns	ns	ns	-.16*	ns	ns

Level of significance:
ns = not significant
* = p < .01
** = p < .001

---

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data

TABLE III-D-23a

Standardized Gain Score Analysis for Teacher/Teacher Aide Characteristics--Grade 4[a]

Teacher/ Teacher Aide Characteristics	OUTCOMES CTBS Reading Total Score	CTBS Reading Total Score Rescored	CTBS Reading Vocabulary Score	ESL Test Score	SSL Test Score	Prueba de Lectura Score	CTBS Math Computation Score	CTBS Math Total Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Overall Teacher Qualifications	-.06*	-.06*	-.08*	ns	-.14**	ns	ns	ns	ns	ns	ns
Non-Classroom Teacher Use of English	ns	ns	ns	ns	ns	-.15*	.09*	ns	ns	ns	.12*
Non-Classroom Teacher Use of Spanish	ns	ns	ns	ns	ns	.17**	-.17**	-.09**	ns	ns	ns
Teacher Bilinguality	.06*	.06*	ns	ns	[illegible]	.16**	-.08*	ns	ns	ns	ns
Bilingual Teacher Qualifications	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Overall Aide Qualifications	ns	ns	ns	ns	ns	ns	ns	ns	ns	.19**	ns
Non-Classroom Aide Use of English	.11**	.11**	.12*	ns	ns	ns	ns	ns	-.21**	ns	ns
Non-Classroom Aide Use of Spanish	-.10*	-.10*	-.13**	ns	ns	ns	ns	ns	.18*	ns	ns
Aide Bilinguality	ns	ns	-.10*	ns	ns	ns	ns	ns	ns	-.15*	ns
Aide Bilingual Teacher Qualifications	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns

Level of significance:
ns = not significant
* = $p < .01$
** = $p < .001$

---

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data

TABLE III-D-24a

Standardized Gain Score Analysis for Teacher/Teacher Aide Characteristics--Grade 5[a]

Teacher/ Teacher Aide Characteristics	OUTCOMES										
	CTBS Reading Total Score	CTBS Reading Total Score Rescored	CTBS Reading Vocabulary Score	ESL Test Score	SSL Test Score	Prueba de Lectura Score	CTBS Math Computation Score	CTBS Math Total Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Overall Teacher Qualifications	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Non-Classroom Teacher Use of English	ns	ns	ns	ns	ns	.48**	ns	ns	ns	ns	ns
Non-Classroom Teacher Use of Spanish	ns	ns	ns	ns	ns	-.47**	ns	.11*	ns	ns	ns
Teacher Bilinguality	ns	ns	ns	ns	ns	-.41**	ns	ns	ns	ns	ns
Bilingual Teacher Qualifications	.12*	.12*	ns	ns	ns	ns	ns	ns	ns	ns	ns
Overall Aide Qualifications	ns	ns	ns	ns	ns	ns	.25**	.26**	ns	ns	ns
Non-Classroom Aide Use of English	-.19*	-.20**	ns	ns	-.14*	ns	-.32**	-.38**	-.34**	-.19*	ns
Non-Classroom Aide Use of Spanish	.19*	.19**	ns	ns	.15*	ns	.32**	.38**	.35**	.20**	ns
Aide Bilinguality	ns	ns	ns	ns	ns	ns	.40**	.52**	ns	ns	ns
Aide Bilingual Teacher Qualifications	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns

Level of significance:
ns = not significant
* = p < .01
** = p < .001

---

[a] NA - Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data

TABLE III-D-25a

Standardized Gain Score Analysis for Teacher/Teacher Aide Characteristics--Grade 6[a]

Teacher/ Teacher Aide Characteristics	OUTCOMES										
	CTBS Reading Total Score	CTBS Reading Total Score Rescored	CTBS Reading Vocabulary Score	ESL Test Score	SSL Test Score	Prueba de Lectura Score	CTBS Math Computation Score	CTBS Math Total Score	Attitude Toward School	Attitude Toward English	Attitude Toward Spanish
Overall Teacher Qualifications	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Non-Classroom Teacher Use of English	ns	ns	ns	ns	ns	ns	-.18**	ns	ns	ns	ns
Non-Classroom Teacher Use of Spanish	-.11*	-.11*	ns	ns	ns	ns	ns	ns	ns	ns	ns
Teacher Bilinguality	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Bilingual Teacher Qualifications	ns	ns	ns	ns	ns	ns	-.27**	-.17**	ns	ns	ns
Overall Aide Qualifications	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Non-Classroom Aide Use of English	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Non-Classroom Aide Use of Spanish	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Aide Bilinguality	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Aide Bilingual Teacher Qualifications	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns

Level of significance:
ns = not significant
* = $p < .01$
** = $p < .001$

---

[a] NA = Relationship not computed since mathematics scores were obtained from either Spanish or English versions of the same test.

[b] Cannot be computed because of insufficient data

BIBLIOGRAPHY

Campbell, D. T., & Boruch, R.F. Making the case for randomized assignment to treatments by considering the alternatives: Six ways in which quasi-experimental evaluations in compensatory education tend to underestimate effects. In C. A. Bennett & A. A. Lumsdaine (Eds.), Evaluation and Experiment. New York: Academic Press, 1975.

Coles, G. J., Chalupsky, A. B., Everett, B. E., Shaycoft, M. F., Rodabaugh, B. J., & Danoff, M. N. Impact of educational innovation on student performance: Project methods and findings for three cohorts. Project LONGSTEP final report: Volume I, appendices. Palo Alto, California: American Institutes for Research, 1976.

Epstein, Noel. Language, ethnicity, and the schools. Washington, D.C.: Institute for Educational Leadership, George Washington University, 1977.

General Accounting Office. Bilingual education, an unmet need. Washington, D.C.: Government Printing Office, May 1976.

Kenny, David A. Quasi-experimental approach to assessing treatment effects in the nonequivalent control group design. Psychological Bulletin, 1975, 82(3), 345-362.

Lord, F. M. A paradox in the interpretation of group comparisons. Psychological Bulletin, 1967, 68, 304-305.

O'Connor, Jr., E. F. Why matching analyses of covariance, and multiple regression generally fail to control for pre-existing differences. Paper presented at Western Psychological Association. Anaheim, California, May 1973.

Siegel, Sidney. Nonparametric statistics for the behavioral sciences. New York: McGraw-Hill, 1956.

Tallmadge, G. K., & Wood, C. T. User's guide. ESEA Title I evaluation and reporting system. Mountain View, California: RMC Research Corporation, 1976.

Trisman, D. A., Waller, M. I., & Wilder, G. Descriptive and analytic study of compensatory reading programs. Final Report: Volume I. Princeton, New Jersey: Educational Testing Service, 1975.

U.S. Congress, House, Committee on Education and Labor, Part 3: Bilingual education: Hearing before the Subcommittee on Elementary, Secondary, and Vocational Education, 95th Congress, 1st sess., 7, 8, and 9 June, 1977.

Wilson, S. R., and Wise, L. L. The American citizen: 11 years after high school. Palo Alto, California: American Institutes for Research, June 1975.